AUTHENTICATED
U.S. GOVERNMENT
INFORMATION
GPO

Calendar No. 525

116TH CONGRESS
2D SESSION

S. 2800

[Report No. 116–262]

To authorize programs of the National Aeronautics and Space Administration, and for other purposes.

IN THE SENATE OF THE UNITED STATES

NOVEMBER 6, 2019

Mr. CRUZ (for himself, Ms. SINEMA, Mr. WICKER, and Ms. CANTWELL) introduced the following bill; which was read twice and referred to the Committee on Commerce, Science, and Transportation

SEPTEMBER 8, 2020

Reported by Mr. WICKER, with an amendment

[Strike out all after the enacting clause and insert the part printed in italic]

A BILL

To authorize programs of the National Aeronautics and Space Administration, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE; TABLE OF CONTENTS.

(a) SHORT TITLE.—This Act may be cited as the "National Aeronautics and Space Administration Authorization Act of 2019".

(b) TABLE OF CONTENTS.—The table of contents of this Act is as follows:

SEC. 2. DEFINITIONS.

In this Act:

(1) ADMINISTRATION.—The term ''Administration'' means the National Aeronautics and Space Administration.

(2) ADMINISTRATOR.—The term ''Administrator'' means the Administrator of the National Aeronautics and Space Administration.

(3) APPROPRIATE COMMITTEES OF CONGRESS.—Except as otherwise expressly provided, the term ''appropriate committees of Congress'' means—

(A) the Committee on Commerce, Science, and Transportation of the Senate; and

(B) the Committee on Science, Space, and Technology of the House of Representatives.

(4) CISLUNAR SPACE.—The term ''cislunar space'' means the region of space beyond low-Earth orbit out to and including the region around the surface of the Moon.

(5) DEEP SPACE.—The term ''deep space'' means the region of space beyond low-Earth orbit, including cislunar space.

(6) DEVELOPMENT COST.—The term ''development cost'' has the meaning given the term in section 30104 of title 51, United States Code.

(7) ISS.—The term ''ISS'' means the International Space Station.

(8) ISS MANAGEMENT ENTITY.—The term ''ISS management entity'' means the organization with which the Administrator has entered into a cooperative agreement under section 504(a) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18354(a)).

(9) NASA.—The term ''NASA'' means the National Aeronautics and Space Administration.

(10) ORION.—The term ''Orion'' means the multipurpose crew vehicle described in section 303 of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18323).

(11) OSTP.—The term ''OSTP'' means the Office of Science and Technology Policy.

(12) SPACE LAUNCH SYSTEM.—The term ''Space Launch System'' means the Space Launch System authorized under section 302 of the National Aeronautics and Space Administration Act of 2010 (42 U.S.C. 18322).

TITLE I—AUTHORIZATION OF APPROPRIATIONS

SEC. 101. AUTHORIZATION OF APPROPRIATIONS.

There are authorized to be appropriated to the Administration for fiscal year 2020 $22,750,000,000 as follows:

(1) For Exploration, $6,222,600,000.

(2) For Space Operations, $4,150,200,000.

(3) For Science, $6,905,700,000.

(4) For Aeronautics, $783,900,000.

(5) For Space Technology, $1,076,400,000.

(6) For Science, Technology, Engineering, and Mathematics Engagement, $112,000,000.

(7) For Safety, Security, and Mission Services, $2,934,800,000.

(8) For Construction and Environmental Compliance and Restoration, $524,400,000.

(9) For Inspector General, $40,000,000.

TITLE II—HUMAN SPACEFLIGHT AND EXPLORATION

SEC. 201. ADVANCED CISLUNAR AND LUNAR SURFACE CAPABILITIES.

(a) SENSE OF CONGRESS.—It is the sense of Congress that—

(1) commercial entities in the United States have made significant investment and progress toward the development of human-class lunar landers;

(2) NASA developed the Artemis program—

(A) to fulfil the goal of landing United States astronauts, include the first woman and the next man, on the Moon; and

(B) to collaborate with commercial and international partners to establish sustainable lunar exploration by 2028; and

(3) in carrying out the Artemis program, the Administration should ensure that the entire Artemis program is inclusive and representative of all people of the United States, including women and minorities.

(b) LANDER PROGRAM.—The Administrator shall foster the development of not more than 2 human-class lunar lander designs through public-private partnerships.

(c) REQUIREMENTS.—In carrying out the program under subsection (b), the Administrator shall—

(1) enter into industry-led partnerships using a fixed-price, milestone-based approach;

(2) to the maximum extent practicable, encourage reusability and sustainability of systems developed;

(3) ensure availability of 1 or more lunar polar science payloads for a demonstration mission; and

(4) to the maximum extent practicable, offer existing capabilities and assets of NASA centers to support these partnerships.

SEC. 202. SPACE LAUNCH SYSTEM CONFIGURATIONS.

(a) MOBILE LAUNCH PLATFORM.—The Administrator is authorized to maintain 2 operational mobile launch platforms to enable the launch of multiple configurations of the Space Launch System.

(b) EXPLORATION UPPER STAGE.—To meet the capability requirements under section 302(c)(2) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18322(c)(2)), the Administrator shall continue development of the Exploration Upper Stage for the Space Launch System with a scheduled availability sufficient for use on the third launch of the Space Launch System.

(c) BRIEFING.—Not later than 90 days after the date of the enactment of this Act, the Administrator shall brief the appropriate committees of Congress on the development and scheduled availability of the Exploration Upper Stage for the third launch of the Space Launch System.

(d) MAIN PROPULSION TEST ARTICLE.—To meet the requirements under section 302(c)(3) of the National Aer-

onautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18322(c)(3)), the Administrator shall—

(1) immediately on completion of the first full-duration integrated core stage test of the Space Launch System, initiate development of a main propulsion test article for the integrated core stage propulsion elements of the Space Launch System;

(2) not later than 180 days after the date of the enactment of this Act, submit to the appropriate committees of Congress a detailed plan for the development and operation of such main propulsion test article; and

(3) use existing capabilities of NASA centers for the design, manufacture, and operation of the main propulsion test article.

SEC. 203. ADVANCED SPACESUITS.

(a) SENSE OF CONGRESS.—It is the sense of Congress that next-generation advanced spacesuits are a critical technology for human space exploration and use of low-Earth orbit, cislunar space, the surface of the Moon, and Mars.

(b) DEVELOPMENT PLAN.—The Administrator shall establish a detailed plan for the development and manufacture of advanced spacesuits, consistent with the deep space exploration goals and timetables of NASA.

~~(c) DIVERSE ASTRONAUT CORPS.—The Administrator shall ensure that spacesuits developed and manufactured after the date of the enactment of this Act are capable of accommodating a wide range of sizes of astronauts so as to meet the needs of the diverse NASA astronaut corps.~~

~~(d) ISS USE.—Throughout the operational life of the ISS, the Administrator should fully use the ISS for testing advanced spacesuits.~~

~~(e) PRIOR INVESTMENTS.—~~

~~(1) IN GENERAL.—In developing an advanced spacesuit, the Administrator shall, to the maximum extent practicable, leverage prior and existing investments in advanced spacesuit technologies to maximize the benefits of such investments and technologies.~~

~~(2) AGREEMENTS WITH PRIVATE ENTITIES.—In carrying out this subsection, the Administrator may enter into 1 or more agreements with 1 or more private entities for the manufacture of advanced spacesuits, as the Administrator considers appropriate.~~

~~(f) BRIEFING.—Not later than 180 days after the date of the enactment of this Act, and semiannually thereafter until NASA procures advanced spacesuits under this~~

section, the Administrator shall brief the appropriate committees of Congress on the development plan in subsection (b).

SEC. 204. LIFE SCIENCE AND PHYSICAL SCIENCE RESEARCH.

(a) SENSE OF CONGRESS.—It is the sense of Congress that—

(1) the 2011 decadal survey on biological and physical sciences in space identifies—

(A) many areas in which fundamental scientific research is needed to efficiently advance the range of human activities in space, from the first stages of exploration to eventual economic development; and

(B) many areas of basic and applied scientific research that could use the microgravity, radiation, and other aspects of the spaceflight environment to answer fundamental scientific questions; and

(2) given the central role of life science and physical science research in developing the future of space exploration, NASA should continue to invest strategically in such research to maintain United States leadership in space exploration; and

(3) such research remains important to the objectives of NASA with respect to long-duration deep space human exploration to the Moon and Mars.

(b) PROGRAM CONTINUATION.—

(1) IN GENERAL.—In support of the goals described in section 20302 of title 51, United States Code, the Administrator shall continue to implement a collaborative, multidisciplinary life science and physical science fundamental research program—

(A) to build a scientific foundation for the exploration and development of space;

(B) to investigate the mechanisms of changes to biological systems and physical systems, and the environments of those systems in space, including the effects of long-duration exposure to deep space-related environmental factors on those systems;

(C) to understand the effects of combined deep space radiation and altered gravity levels on biological systems so as to inform the development and testing of potential countermeasures;

(D) to understand physical phenomena in reduced gravity that affect design and perform-

ance of enabling technologies necessary for the space exploration program;

(E) to provide scientific opportunities to educate, train, and develop the next generation of researchers and engineers; and

(F) to provide state-of-the-art data repositories and curation of large multi-data sets to enable comparative research analyses.

(2) ELEMENTS.—The program under paragraph (1) shall—

(A) include fundamental research relating to life science, space bioscience, and physical science; and

(B) maximize intra-agency and interagency partnerships to advance space exploration, scientific knowledge, and benefits to Earth.

(3) USE OF FACILITIES.—In carrying out the program under paragraph (1), the Administrator may use ground-based, air-based, and space-based facilities in low-Earth orbit and beyond low-Earth orbit.

SEC. 205. ACQUISITION OF DOMESTIC SPACE TRANSPORTATION AND LOGISTICS RESUPPLY SERVICES.

(a) IN GENERAL.—Except as provided in subsection (b), the Administrator shall not enter into any contract with a person or entity that proposes to use, or will use, a foreign launch provider for a commercial service to provide space transportation or logistics resupply for—

(1) the ISS; or

(2) any Government-owned or Government-funded platform in Earth orbit or cislunar space, on the lunar surface, or elsewhere in space.

(b) EXCEPTION.—The Administrator may enter into a contract with a person or entity that proposes to use, or will use, a foreign launch provider for a commercial service to carry out an activity described in subsection (a) if a domestic vehicle or service is unavailable.

(c) RULE OF CONSTRUCTION.—Nothing in this section shall be construed to prohibit the Administrator from entering into 1 or more no-exchange-of-funds collaborative agreements with an international partner in support of the deep space exploration plan of NASA.

SEC. 206. ROCKET ENGINE TEST INFRASTRUCTURE.

(a) IN GENERAL.—The Administrator shall carry out a program to modernize rocket propulsion test infrastructure at NASA facilities—

(1) to increase capabilities;

(2) to enhance safety;

(3) to support propulsion development and testing; and

(4) to foster the improvement of Government and commercial space transportation and exploration.

(b) PROJECTS.—Projects funded under the program under subsection (a) may include—

(1) infrastructure and other facilities and systems relating to rocket propulsion test stands and rocket propulsion testing;

(2) enhancements to test facility capacity and flexibility; and

(3) such other projects as the Administrator considers appropriate to meet the goals described in subsection (a).

(c) REQUIREMENTS.—In carrying out the program under subsection (a), the Administrator shall—

(1) prioritize investments in projects that enhance test and flight certification capabilities for large thrust-level atmospheric and altitude engines and engine systems, and multi-engine integrated test capabilities; and

(2) ensure that no project carried out under this program shall adversely impact, delay, or defer testing or other activities associated with facilities used for Government programs, including—

(A) the Space Launch System and the Exploration Upper Stage of the Space Launch System;

(B) in-space propulsion to support exploration missions; or

(C) nuclear propulsion testing.

(d) SAVINGS CLAUSE.—Nothing in this section shall preclude a NASA program, including the Space Launch System and the Exploration Upper Stage of the Space Launch System, from using the modernized test infrastructure developed under this section.

SEC. 207. INDIAN RIVER BRIDGE.

The Administrator, in coordination with the heads of other Federal agencies that use the Indian River Bridge on the NASA Causeway, shall develop a plan to ensure that a bridge over the Indian River at such location provides access to the Eastern Range for national security, civil, and commercial space operations.

SEC. 208. VALUE OF INTERNATIONAL SPACE STATION AND CAPABILITIES IN LOW-EARTH ORBIT.

(a) SENSE OF CONGRESS.—It is the sense of Congress that—

(1) it is in the national and economic security interests of the United States to maintain a continuous human presence in low-Earth orbit;

(2) low-Earth orbit should be used as a test bed to advance human space exploration and scientific discoveries; and

(3) the ISS is a critical component of economic, commercial, and industrial development in low-Earth orbit.

(b) HUMAN PRESENCE REQUIREMENT.—The United States shall continuously maintain the capability for a continuous human presence in low-Earth orbit through and beyond the useful life of the ISS.

SEC. 209. EXTENSION AND MODIFICATION RELATING TO INTERNATIONAL SPACE STATION.

(a) POLICY.—Section 501(a) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18351(a)) is amended by striking ''2024'' and inserting ''2030''.

(b) MAINTENANCE OF UNITED STATES SEGMENT AND ASSURANCE OF CONTINUED OPERATIONS.—Section 503(a) of the National Aeronautics and Space Administra-

tion Authorization Act of 2010 (42 U.S.C. 18353(a)) is amended by striking ''September 30, 2024'' and inserting ''September 30, 2030''.

(c) RESEARCH CAPACITY ALLOCATION AND INTEGRATION OF RESEARCH PAYLOADS.—Section 504(d) of the National Aeronauties and Space Administration Authorization Act of 2010 (42 U.S.C. 18354(d)) is amended—

(1) in paragraph (1), in the first sentence—

(A) by striking ''As soon as practicable'' and all that follows through ''2011,'' and inserting ''The''; and

(B) by striking ''September 30, 2024'' and inserting ''September 30, 2030''; and

(2) in paragraph (2), in the third sentence, by striking ''September 30, 2024'' and inserting ''September 30, 2030''.

(d) MAINTENANCE OF USE.—

(1) IN GENERAL.—Section 70907 of title 51, United States Code, is amended—

(A) in the section heading, by striking ''**2024**'' and inserting ''**2030**'';

(B) in subsection (a), by striking ''September 30, 2024'' and inserting ''September 30, 2030''; and

(C) in subsection (b)(3), by striking ''September 30, 2024'' and inserting ''September 30, 2030''.

(e) TRANSITION PLAN REPORTS.—Section 50111(c)(2) of title 51, United States Code is amended—

(1) in the matter preceding subparagraph (A), by striking ''2023'' and inserting ''2028''; and

(2) in subparagraph (J), by striking ''2028'' and inserting ''2030''.

(f) ELIMINATION OF INTERNATIONAL SPACE STATION NATIONAL LABORATORY ADVISORY COMMITTEE.—Section 70906 of title 51, United States Code, is repealed.

(g) CONFORMING AMENDMENTS.—Chapter 709 of title 51, United States Code, is amended—

(1) by redesignating section 70907 as section 70906; and

(2) in the table of sections for the chapter, by striking the items relating to sections 70906 and 70907 and inserting the following:

''Sec. 70906. Maintaining use through at least 2030.''.

SEC. 210. DEPARTMENT OF DEFENSE ACTIVITIES ON INTERNATIONAL SPACE STATION.

(a) IN GENERAL.—Not later than March 1, 2020, the Secretary of Defense shall—

(1) identify and review each activity, program, and project of the Department of Defense com-

pleted, being carried out, or planned to be carried out on the ISS as of the date of the review; and

(2) provide to the appropriate committees of Congress a briefing that describes the results of the review.

(b) APPROPRIATE COMMITTEES OF CONGRESS DEFINED.—In this section, the term ''appropriate committees of Congress'' means—

(1) the Committee on Armed Services and the Committee on Commerce, Science, and Transportation of the Senate; and

(2) the Committee on Armed Services and the Committee on Science, Space, and Technology of the House of Representatives.

SEC. 211. LOW-EARTH ORBIT COMMERCIALIZATION.

(a) STATEMENT OF POLICY.—It is the policy of the United States to encourage the development of a thriving and robust United States commercial sector in low-Earth orbit.

(b) PREFERENCE FOR UNITED STATES COMMERCIAL PRODUCTS AND SERVICES.—The Administrator shall continue to increase the use of assets, products, and services of private entities in the United States to fulfill the low-Earth orbit requirements of the Administration.

(c) NONCOMPETITION.—

(1) IN GENERAL.—Except as provided in paragraph (2), the Administrator may not offer to a foreign person or a foreign government a spaceflight product or service relating to the ISS, if a comparable spaceflight product or service, as applicable, is offered by a private entity in the United States.

(2) EXCEPTION.—The Administrator may offer a space-flight product or service relating to the ISS to the government of a country that is a signatory to the Agreement Among the Government of Canada, Governments of Member States of the European Space Agency, the Government of Japan, the Government of the Russian Federation, and the Government of the United States of America Concerning Cooperation on the Civil International Space Station, signed at Washington January 29, 1998, and entered into force on March 27, 2001 (TIAS 12927).

(d) SHORT-DURATION COMMERCIAL MISSIONS.—To provide opportunities for additional transport of astronauts to the ISS and help establish a commercial market in low-Earth orbit, the Administrator may permit short-duration missions to the ISS for commercial passengers.

(e) PROGRAM AUTHORIZATION.—

(1) ESTABLISHMENT.—The Administrator shall establish a low-Earth orbit commercialization program to encourage the fullest commercial use and development of space by private entities in the United States.

(2) ELEMENTS.—The program established under paragraph (1) shall, to the maximum extent practicable, include activities—

(A) to stimulate demand for—

(i) space-based commercial research, development, and manufacturing;

(ii) spaceflight products and services; and

(iii) human spaceflight products and services in low-Earth orbit;

(B) to improve the capability of the ISS to accommodate commercial users; and

(C) subject to paragraph (3), to foster the development of commercial space stations and habitats.

(3) COMMERCIAL SPACE STATIONS AND HABITATS.—

(A) PRIORITY.—With respect to an activity to develop a commercial space station or habitat, the Administrator shall give priority to an

activity for which a private entity provides a share of the cost to develop and operate the activity.

(B) LIMITATION.—The Administrator may not provide funding for the development of a commercial space station or habitat until after the date on which the Administrator awards a contract for the use of a docking port on the ISS.

(C) REPORT.—Not later than 30 days after the date that an award or agreement is made to carry out an activity to develop a commercial space station or habitat, the Administrator shall submit to the appropriate committees of Congress a report on the development of the commercial space station or habitat, as applicable, that includes—

(i) a business plan that describes the manner in which the project will—

(I) meet the future requirements of NASA for low-Earth orbit human space-flight services; and

(II) fulfill the cost-share funding prioritization under subparagraph (A); and

(ii) a review of the viability of the operational business case, including—

(I) the level of expected Government participation;

(II) a list of anticipated nongovernmental an international customers and associated contributions; and

(III) an assessment of long-term sustainability for the nongovernmental customers, including an independent assessment of the viability of the market for such commercial services or products.

SEC. 212. MAINTAINING A NATIONAL LABORATORY IN SPACE.

(a) SENSE OF CONGRESS.—It is the sense of Congress that—

(1) the United States segment of the International Space Station (as defined in section 70905 of title 51, United States Code), which is designated as a national laboratory under section 70905(b) of title 51, United States Code—

(A) benefits the scientific community and promotes commerce in space;

~~(B) fosters stronger relationships among NASA and other Federal agencies, the private sector, and research groups and universities;~~

~~(C) advances science, technology, engineering, and mathematics education through use of the unique microgravity environment; and~~

~~(D) advances human knowledge and international cooperation;~~

~~(2) after the ISS is decommissioned, the United States should maintain a national microgravity laboratory in space;~~

~~(3) in maintaining a national microgravity laboratory in space, the United States should make appropriate accommodations for different types of ownership and operation arrangements for the ISS and future space stations;~~

~~(4) to the maximum extent practicable, a national microgravity laboratory in space should be maintained in cooperation with international space partners; and~~

~~(5) NASA should continue to support fundamental science research on future platforms in low-Earth orbit and cislunar space, orbital and suborbital flights, drop towers, and other microgravity testing environments.~~

(b) REPORT.—The Administrator, in coordination with the National Space Council and other Federal agencies as the Administrator considers appropriate, shall issue a report detailing the feasibility of establishing a microgravity national laboratory federally funded research and development center to carry out activities relating to the study and use of in-space conditions.

SEC. 213. INTERNATIONAL SPACE STATION NATIONAL LABORATORY; PROPERTY RIGHTS IN INVENTIONS.

(a) IN GENERAL.—Subchapter III of chapter 201 of title 51, United States Code, is amended by adding at the end the following:

"§ 20150. Property rights in designated inventions

"(a) EXCLUSIVE PROPERTY RIGHTS.—Notwithstanding section 3710a of title 15, chapter 18 of title 35, section 20135, or any other provision of law, a designated invention shall be the exclusive property of a user, and shall not be subject to a Government-purpose license, if—

"(1) the Administration is reimbursed under the terms of the contract for the full cost of a contribution by the Federal Government of the use of Federal facilities, equipment, materials, proprietary information of the Federal Government, or services of a Federal employee during working hours, includ-

ing the cost for the Administration to carry out its responsibilities under paragraphs (1) and (4) of section 504(d) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18354(d));

"(2) Federal funds are not transferred to the user under the contract; and

"(3) the invention was made (as defined in section 20135(a))—

"(A) solely by the user; or

"(B)(i) by the user with the services of a Federal employee under the terms of the contract; and

"(ii) the Administration is reimbursed for such services under paragraph (1).

"(b) RULE OF CONSTRUCTION.—Nothing in this section may be construed to affect the rights of the Federal Government, including property rights in inventions, under any contract, except in the case of a written contract with the Administration or the ISS management entity for the performance of a designated activity.

"(c) DEFINITIONS.—In this section—

"(1) CONTRACT.—The term 'contract' has the meaning giving the term in section 20135(a).

''(2) DESIGNATED ACTIVITY.—The term 'designated activity' means any non-NASA scientific use of the ISS national laboratory as described in section 504 of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18354).

''(3) DESIGNATED INVENTION.—The term 'designated invention' means any invention conceived or first reduced to practice by any person in the performance of a designated activity under a written contract with the Administration or the ISS management entity.

''(4) GOVERNMENT-PURPOSE LICENSE.—The term 'Government-purpose license' means the reservation by the Federal Government of an irrevocable, nonexclusive, nontransferable, royalty-free license for the use of an invention throughout the world by or on behalf of the United States or any foreign government pursuant to a treaty or agreement with the United States.

''(5) ISS MANAGEMENT ENTITY.—The term 'ISS management entity' means the organization with which the Administrator enters into a cooperative agreement under section 504(a) of the National

Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18354(a)).

''(6) USER.—The term 'user' means a person, including a nonprofit organization or small business firm (as such terms are defined in section 201 of title 35), or class of persons that enters into a written contract with the Administration or the ISS management entity for the performance of designated activities.''.

(b) CONFORMING.—The table of sections for chapter 201 of title 51, United States Code, is amended by inserting after the item relating to section 20149 the following:

''20150. Property rights in designated inventions.''.

SEC. 214. DATA FIRST PRODUCED DURING NON-NASA SCIENTIFIC USE OF THE ISS NATIONAL LABORATORY.

(a) DATA RIGHTS.—Subchapter III of chapter 201 of title 51, United States Code, as amended by section 213, is further amended by adding at the end the following:

''§ 20151. Data rights

''(a) NON-NASA SCIENTIFIC USE OF THE ISS NATIONAL LABORATORY.—The Federal Government may not use or reproduce, or disclose outside of the Government, any data first produced in the performance of a designated

activity under a written contract with the Administration or the ISS management entity, unless—

"(1) otherwise agreed under the terms of the contract with the Administration or the ISS management entity, as applicable;

"(2) the designated activity is carried out with Federal funds;

"(3) disclosure is required by law;

"(4) the Federal Government has rights in the data under another Federal contract, grant, cooperative agreement, or other transaction; or

"(5) the data is—

"(A) otherwise lawfully acquired or independently developed by the Federal Government;

"(B) related to the health and safety of personnel on the ISS; or

"(C) essential to the performance of work by the ISS management entity or NASA personnel.

"(b) DEFINITIONS.—In this section:

"(1) CONTRACT.—The term 'contract' has the meaning given the term under section 20135(a).

"(2) DATA.—

''(A) IN GENERAL.—The term 'data' means recorded information, regardless of form or the media on which it may be recorded.

''(B) INCLUSIONS.—The term 'data' includes technical data and computer software.

''(C) EXCLUSIONS.—The term 'data' does not include information incidental to contract administration, such as financial, administrative, cost or pricing, or management information.

''(3) DESIGNATED ACTIVITY.—The term 'designated activity' has the meaning given the term in section 20150.

''(4) ISS MANAGEMENT ENTITY.—The term 'ISS management entity' has the meaning given the term in section 20150.''.

(b) SPECIAL HANDLING OF TRADE SECRETS OR CONFIDENTIAL INFORMATION.—Section 20131(b)(2) of title 51, United States Code, is amended to read as follows:

''(2) INFORMATION DESCRIBED.—

''(A) ACTIVITIES UNDER AGREEMENT.—Information referred to in paragraph (1) is information that—

''(i) results from activities conducted under an agreement entered into under subsections (e) and (f) of section 20113; and

''(ii) would be a trade secret or commercial or financial information that is privileged or confidential within the meaning of section 552(b)(4) of title 5 if the information had been obtained from a non-Federal party participating in such an agreement.

''(B) CERTAIN DATA.—Information referred to in paragraph (1) includes data (as defined in section 20151) that—

''(i) was first produced by the Administration in the performance of any designated activity (as defined in section 20150); and

''(ii) would be a trade secret or commercial or financial information that is privileged or confidential within the meaning of section 552(b)(4) of title 5 if the data had been obtained from a non-Federal party.''.

(c) CONFORMING AMENDMENT.—The table of sections for chapter 201 of title 51, United States Code, as amended by section 213, is further amended by inserting after the item relating to section 20150 the following:

"20151. Data rights.".

SEC. 215. ROYALTIES AND OTHER PAYMENTS RECEIVED FOR DESIGNATED ACTIVITIES.

(a) SENSE OF CONGRESS.—It is the sense of Congress that the Administrator should determine a threshold for which it may be appropriate for NASA to recoup the costs of supporting the creation of invention aboard the ISS, through the negotiation of royalties, similar to agreements made by other Federal agencies that support private sector innovation.

(b) IN GENERAL.—Subchapter III of chapter 201 of title 51, United States Code, as amended by sections 213 and 214, is further amended by adding at the end the following:

"§ 20152. Royalties and other payments received for designated activities

"(a) DESIGNATED INVENTIONS MADE WITH FEDERAL ASSISTANCE.—Notwithstanding any other provision of law, if the Administration, under the terms of a written contract for the performance of a designated activity, agrees to provide, unreimbursed, the total cost of a contribution by the Federal Government of the use of Federal

facilities, equipment, materials, proprietary information of the Federal Government, or services of a Federal employee during working hours, including the cost for the Administration to carry out its responsibilities under paragraphs (1) and (4) of section 504(d) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18354(d)), the Administrator shall negotiate an agreement on the terms and rates of royalty payments with respect to an invention or class of inventions conceived or first reduced to practice by any person or class of persons in the performance of such designated activities.

''(b) LICENSING AND ASSIGNMENT OF INVENTIONS.—Notwithstanding sections 3710a and 3710c of title 15 and any other provision of law, after payment in accordance with subsection (A)(i) of such section 3710c(a)(1)(A)(i) to the inventors who have directly assigned to the Federal Government their interests in an invention under a written contract with the Administration or the ISS management entity for the performance of a designated activity, the balance of any royalty or other payment received by the Administrator or the ISS management entity from licensing and assignment of such invention shall be paid by the Administrator or the ISS

management entity, as applicable, to the Space Exploration Fund.

''(c) SPACE EXPLORATION FUND.—

''(1) ESTABLISHMENT.—There is established in the Treasury of the United States a fund, to be known as the 'Space Exploration Fund' (referred to in this subsection as the 'Fund'), to be administered by the Administrator.

''(2) USE OF FUND.—The Fund shall be available without fiscal year limitation and without further appropriation to carry out space exploration activities under section 20302.

''(3) DEPOSITS.—There shall be deposited in the Fund—

''(A) amounts appropriated to the Fund;

''(B) fees and royalties collected by the Administrator or the ISS management entity under subsections (a) and (b); and

''(C) donations or contributions designated to support authorized activities.

''(4) RULE OF CONSTRUCTION.—Amounts available to the Administrator under this subsection shall be in addition to amounts otherwise made available for the purpose described in paragraph (2).

''(d) DEFINITIONS.—The terms used in this section have the meanings given the terms in section 20150.''.

(c) CONFORMING AMENDMENT.—The table of sections for chapter 201 of title 51, United States Code, as amended by sections 213 and 214, is further amended by inserting after the item relating to section 20151 the following:

''20152. Royalties and other payments received for designated activities.''.

SEC. 216. STEPPINGSTONE APPROACH TO EXPLORATION.

(a) IN GENERAL.—Section 70504 of title 51, United States Code, is amended to read as follows:

''§ 70504. Steppingstone approach to exploration

''(a) IN GENERAL.—The Administrator, in sustainable steps, may conduct missions to intermediate destinations, such as the Moon, in accordance with section 20302(b), and on a timetable determined by the availability of funding, in order to achieve the objective of human exploration of Mars specified in section 202(b)(5) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18312(b)(5)), if the Administrator—

''(1) determines that each such mission demonstrates or advances a technology or operational concept that will enable human missions to Mars; and

"(2) incorporates each such mission into the human exploration roadmap under section 432 of the National Aeronautics and Space Administration Transition Authorization Act of 2017 (Public Law 115–10; 51 U.S.C. 20302 note).

"(b) CISLUNAR SPACE EXPLORATION ACTIVITIES.—In conducting a mission under subsection (a), the Administrator shall—

"(1) use a combination of launches of the Space Launch System and space transportation services from United States commercial providers, as appropriate, for the mission;

"(2) plan for not fewer than 1 Space Launch System launch annually beginning after the first successful crewed launch of Orion on the Space Launch System; and

"(3) establish an outpost in orbit around the Moon that—

"(A) demonstrates technologies, systems, and operational concepts directly applicable to the space vehicle that will be used to transport humans to Mars;

"(B) has the capability for periodic human habitation; and

''(C) can function as a point of departure, return, or staging for Administration or non-governmental or international partner missions to multiple locations on the lunar surface or other destinations.

''(c) COST-EFFECTIVENESS.—To maximize the cost-effectiveness of the long-term space exploration and utilization activities of the United States, the Administrator shall take all necessary steps, including engaging non-governmental and international partners, to ensure that activities in the Administration's human space exploration program are balanced in order to help meet the requirements of future exploration and utilization activities leading to human habitation on the surface of Mars.

''(d) COMPLETION.—Within budgetary considerations, once an exploration-related project enters its development phase, the Administrator shall seek, to the maximum extent practicable, to complete that project without undue delay.

''(e) INTERNATIONAL PARTICIPATION.—To achieve the goal of successfully conducting a crewed mission to the surface of Mars, the Administrator shall invite the partners in the ISS program and other nations, as appropriate, to participate in an international initiative under the leadership of the United States.''.

(b) DEFINITION OF CISLUNAR SPACE.—Section 10101 of title 51, United States Code, is amended by adding at the end the following:

"(3) CISLUNAR SPACE.—The term 'cislunar space' means the region of space beyond low-Earth orbit out to and including the region around the surface of the Moon.".

(c) TECHNICAL AND CONFORMING AMENDMENTS.—Section 3 of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18302) is amended by striking paragraphs (2) and (3) and inserting the following:

"(2) APPROPRIATE COMMITTEES OF CONGRESS.—The term 'appropriate committees of Congress' means—

"(A) the Committee on Commerce, Science, and Transportation of the Senate; and

"(B) the Committee on Science, Space, and Technology of the House of Representatives.

"(3) CISLUNAR SPACE.—The term 'cislunar space' means the region of space beyond low-Earth orbit out to and including the region around the surface of the Moon.".

SEC. 217. TECHNICAL AMENDMENTS RELATING TO ARTEMIS MISSIONS.

(1) Section 421 of the National Aeronautics and Space Administration Authorization Act of 2017 (Public Law 115–10; 51 U.S.C. 20301 note) is amended—

(A) in subsection (c)(3)—

(i) by striking ''EM–1'' and inserting ''Artemis 1'';

(ii) by striking ''EM–2'' and inserting ''Artemis 2''; and

(iii) by striking ''EM–3'' and inserting ''Artemis 3''; and

(B) in subsection (f)(3), by striking ''EM–3'' and inserting ''Artemis 3''.

(2) Section 432(b) of the National Aeronautics and Space Administration Authorization Act of 2017 (Public Law 115–10; 51 U.S.C. 20302 note) is amended—

(A) in paragraph (3)(D)—

(i) by striking ''EM–1'' and inserting ''Artemis 1''; and

(ii) by striking ''EM–2'' and inserting ''Artemis 2''; and

(B) in paragraph (4)(C), by striking ''EM–3'' and inserting ''Artemis 3''.

TITLE III—SCIENCE

SEC. 301. SCIENCE PRIORITIES.

(a) SENSE OF CONGRESS ON SCIENCE PORTFOLIO.—Congress reaffirms the sense of Congress that—

(1) a balanced and adequately funded set of activities, consisting of research and analysis grant programs, technology development, suborbital research activities, and small, medium, and large space missions, contributes to a robust and productive science program and serves as a catalyst for innovation and discovery; and

(2) the Administrator should set science priorities by following the guidance provided by the scientific community through the decadal surveys of the National Academies of Sciences, Engineering, and Medicine.

(b) NATIONAL ACADEMIES DECADAL SURVEYS.—Section 20305(c) of title 51, United States Code, is amended—

(1) by striking ''The Administrator shall'' and inserting the following:

''(1) REEXAMINATION OF PRIORITIES BY NATIONAL ACADEMIES.—The Administrator shall''; and

(2) by adding at the end the following:

''(2) REEXAMINATION OF PRIORITIES BY ADMINISTRATOR.—If the Administrator decides to reexamine the applicability of the priorities of the decadal surveys to the missions and activities of the Administration due to scientific discoveries or external factors, the Administrator shall, to the maximum extent practicable, consult with the relevant committees of the National Academies.''.

SEC. 302. LUNAR DISCOVERY PROGRAM.

(a) IN GENERAL.—The Administrator may carry out a program to conduct lunar science research, including missions to the surface of the Moon, that materially contributes to the objective described in section 20102(d)(1) of title 51, United States Code.

(b) COMMERCIAL LANDERS.—In carrying out a program under subsection (a), the Administrator shall procure the services of commercial landers developed primarily by United States industry to land science payloads of all classes on the lunar surface.

(c) LUNAR SCIENCE RESEARCH.—The Administrator shall ensure that lunar science research carried out under subsection (a) is consistent with recommendations made by the National Academies of Sciences, Engineering, and Medicine.

(d) LUNAR POLAR VOLATILES.—In carrying out a program under subsection (a), the Administrator shall, at the earliest opportunity, consider mission proposals to evaluate the potential of lunar polar volatiles to contribute to sustainable lunar exploration.

SEC. 303. SEARCH FOR LIFE.

(a) SENSE OF CONGRESS.—It is the sense of Congress that—

(1) the report entitled ''An Astrobiology Strategy for the Search for Life in the Universe'' published by the National Academies of Sciences, Engineering, and Medicine outlines the key scientific questions and methods for fulfilling the objective of NASA to search for the origin, evolution, distribution, and future of life in the universe; and

(2) the interaction of lifeforms with their environment, a central focus of astrobiology research, is a topic of broad significance to life sciences research in space and on Earth.

(b) PROGRAM CONTINUATION.—

(1) IN GENERAL.—The Administrator shall continue to implement a collaborative, multidisciplinary science and technology development program to search for proof of the existence or historical existence of life beyond Earth in support of the objective

described in section 20102(d)(10) of title 51, United States Code.

(2) ELEMENT.—The program under paragraph (1) shall include activities relating to astronomy, biology, geology, and planetary science.

(3) COORDINATION WITH LIFE SCIENCES PROGRAM.—In carrying out the program under paragraph (1), the Administrator shall coordinate efforts with the life sciences program of the Administration.

(4) TECHNOSIGNATURES.—In carrying out the program under paragraph (1), the Administrator shall support activities to search for and analyze technosignatures.

(5) INSTRUMENTATION AND SENSOR TECHNOLOGY.—In carrying out the program under paragraph (1), the Administrator may strategically invest in the development of new instrumentation and sensor technology.

SEC. 304. JAMES WEBB SPACE TELESCOPE.

(a) SENSE OF CONGRESS.—It is the sense of Congress that—

(1) the James Webb Space Telescope will be the next premier observatory in space and has great potential to further scientific study and assist sci-

entists in making new discoveries in the field of astronomy;

(2) the James Webb Space Telescope was developed as an ambitious project with a scope that was not fully defined at inception and with risk that was not fully known or understood;

(3) despite the major technology development and innovation that was needed to construct the James Webb Space Telescope, major negative impacts to the cost and schedule of the James Webb Space Telescope resulted from poor program management and poor contractor performance;

(4) the Administrator should take into account the lessons learned from the cost and schedule issues relating to the development of the James Webb Space Telescope in making decisions regarding the scope of and the technologies needed for future scientific missions;

(5) in selecting future scientific missions, the Administrator should take into account the impact that large programs that overrun cost and schedule estimates may have on other NASA programs in earlier phases of development; and

(6) the Administrator should continue to develop the James Webb Space Telescope with a devel-

opment cost of not more than $9,000,000,000, as estimated by the James Webb Space Telescope Independent Review Board Report released in May 2018.

(b) PROJECT CONTINUATION.—

(1) IN GENERAL.—The Administrator shall continue—

(A) to closely track the cost and schedule performance of the James Webb Space Telescope project; and

(B) to improve the reliability of cost estimates and contractor performance data throughout the remaining development of the James Webb Space Telescope.

(2) KEY PROGRAM OBJECTIVE.—The Administrator shall continue to develop the James Webb Space Telescope on a schedule to meet the objective of safely launching the James Webb Space Telescope not later than March 31, 2021.

SEC. 305. WIDE-FIELD INFRARED SURVEY TELESCOPE.

(a) SENSE OF CONGRESS.—It is the sense of Congress that—

(1) major growth in the cost of astrophysics flagship-class missions has impacted the overall portfolio balance of the Science Mission Directorate; and

(2) the Administrator should continue to develop the Wide-Field Infrared Survey Telescope with a development cost of not more than $3,200,000,000.

(b) PROJECT CONTINUATION.—The Administrator shall continue to develop the Wide-Field Infrared Survey Telescope to meet the objectives outlined in the 2010 decadal survey on astronomy and astrophysics of the National Academies of Sciences, Engineering, and Medicine in a manner that maximizes scientific productivity based on the resources invested.

SEC. 306. SATELLITE SERVICING FOR SCIENCE MISSIONS.

(a) STUDY.—

(1) IN GENERAL.—The Administrator shall conduct a study on the feasibility of using in-space robotic refueling, repair, or refurbishment capabilities to extend the useful life of telescopes and other science missions that are operational or in development as of the date of the enactment of this Act.

(2) ELEMENTS.—The study conducted under paragraph (1) shall include the following:

(A) An identification of the technologies and in-space testing required to demonstrate the in-space robotic refueling, repair, or refur-

bishment capabilities described in paragraph (1).

(B) The projected cost of using such capabilities, including the cost of extended operations for science missions described in that paragraph.

(b) BRIEFING.—Not later than 1 year after the date of the enactment of this Act, the Administrator shall provide to the appropriate committees of Congress and the Space Studies Board of the National Academies of Sciences, Engineering, and Medicine a briefing on the results of the study conducted under subsection (a)(1).

SEC. 307. EARTH SCIENCE MISSIONS AND PROGRAMS.

(a) SENSE OF CONGRESS.—It is the sense of Congress that the Earth Science Division of NASA plays an important role in national efforts—

(1) to collect and use Earth observations in service to society; and

(2) to understand global change.

(b) EARTH SCIENCE MISSIONS AND PROGRAMS.—With respect to the missions and programs of the Earth Science Division, the Administrator shall, to the maximum extent practicable, follow the recommendations and guidance provided by the scientific community through the decadal survey for Earth science and applications from

space of the National Academies of Sciences, Engineering, and Medicine, including—

(1) the science priorities described in such survey;

(2) the execution of the series of existing or previously planned observations (commonly known as the ''program of record''); and

(3) the development of a range of missions of all classes, including opportunities for principal investigator-led, competitively selected missions.

SEC. 308. SCIENCE MISSIONS TO MARS.

(a) IN GENERAL.—The Administrator shall conduct 1 or more science missions to Mars to enable the selection of 1 or more sites for human landing.

(b) SAMPLE PROGRAM.—The Administrator may carry out a program—

(1) to collect samples from the surface of Mars; and

(2) to return such samples to Earth for scientific analysis.

(c) USE OF EXISTING CAPABILITIES AND ASSETS.—In carrying out this section, the Administrator shall, to the maximum extent practicable, use existing capabilities and assets of NASA centers.

SEC. 309. PLANETARY DEFENSE COORDINATION OFFICE.

(a) FINDINGS.—Congress makes the following findings:

(1) Near-Earth objects remain a threat to the United States.

(2) Section 321(d)(1) of the National Aeronautics and Space Administration Authorization Act of 2005 (Public Law 109–155; 119 Stat. 2922; 51 U.S.C. 71101 note prec.) established a requirement that the Administrator plan, develop, and implement a Near-Earth Object Survey program to detect, track, catalogue, and characterize the physical characteristics of near-Earth objects equal to or greater than 140 meters in diameter in order to assess the threat of such near-Earth objects to the Earth, with the goal of 90-percent completion of the catalogue of such near-Earth objects by December 30, 2020.

(3) The current planetary defense strategy of NASA acknowledges that such goal will not be met.

(4) The report of the National Academies of Sciences, Engineering, and Medicine entitled ''Finding Hazardous Asteroids Using Infrared and Visible Wavelength Telescopes'' issued in 2019 states that—

(A) NASA cannot accomplish such goal with currently available assets;

(B) NASA should develop and launch a dedicated space-based infrared survey telescope to meet the requirements of section 321(d)(1) of the National Aeronautics and Space Administration Authorization Act of 2005 (Public Law 109–155; 119 Stat. 2922; 51 U.S.C. 71101 note prec.); and

(C) the early detection of potentially hazardous near-Earth objects enabled by a space-based infrared survey telescope is important to enable deflection of a dangerous asteroid.

(b) ESTABLISHMENT OF PLANETARY DEFENSE COORDINATION OFFICE.—

(1) IN GENERAL.—Not later than 90 days after the date of the enactment of this Act, the Administrator shall establish an office within the Planetary Science Division of the Science Mission Directorate, to be known as the ''Planetary Defense Coordination Office'', to plan, develop, and implement a program to survey threats posed by near-Earth objects equal to or greater than 140 meters in diameter, as required by section 321(d)(1) of the National Aeronautics and Space Administration Authorization Act of 2005 (Public Law 109–155; 119 Stat. 2922; 51 U.S.C. 71101 note prec.).

(2) ACTIVITIES.—The Administrator shall—

(A) develop and, not later than September 30, 2025, launch a space-based infrared survey telescope that is capable of detecting near-Earth objects equal to or greater than 140 meters in diameter, with preference given to planetary missions selected by the Administrator as of the date of the enactment of this Act to pursue concept design studies relating to the development of a space-based infrared survey telescope;

(B) identify, track, and characterize potentially hazardous near-Earth objects and issue warnings of the effects of potential impacts of such objects; and

(C) assist in coordinating Government planning for response to a potential impact of a near-Earth object.

(c) ANNUAL REPORT.—Section 321(f) of the National Aeronautics and Space Administration Authorization Act of 2005 (Public Law 109–155; 119 Stat. 2922; 51 U.S.C. 71101 note prec.) is amended to read as follows:

''(f) ANNUAL REPORT.—Not later than September 30, 2020, and annually thereafter through 90-percent

completion of the catalogue required by subsection (d)(1), the Administrator shall submit to the Committee on Commerce, Science, and Transportation of the Senate and the Committee on Science, Space, and Technology of the House of Representatives a report that includes the following.

"(1) A summary of all activities carried out by the Planetary Defense Coordination Office established under section 309(b)(1) of the National Aeronautics and Space Administration Authorization Act of 2019 since the date of enactment of that Act.

"(2) A description of the progress with respect to the design, development, and launch of the space-based infrared survey telescope required by section 309(b)(2)(A) of the National Aeronautics and Space Administration Authorization Act of 2019.

"(3) An assessment of the progress toward meeting the requirements of subsection (d)(1).

"(4) A description of the status of efforts to coordinate planetary defense activities in response to a threat posed by a near-Earth object with other Federal agencies since the date of enactment of the National Aeronautics and Space Administration Authorization Act of 2019.

''(5) A description of the status of efforts to coordinate and cooperate with other countries to discover hazardous asteroids and comets, plan a mitigation strategy, and implement that strategy in the event of the discovery of an object on a likely collision course with Earth.

''(6) A summary of expenditures for all activities carried out by the Planetary Defense Coordination Office since the date of enactment of the National Aeronautics and Space Administration Authorization Act of 2019.''.

(d) LIMITATION ON USE OF FUNDS.—Of the amounts authorized to be appropriated by this Act, not more than 80 percent of amounts authorized to be appropriated for the Office of the Administrator for a fiscal year may be obligated or expended until the date on which the Administrator submits the report for such fiscal year required by section 321(f) of the National Aeronautics and Space Administration Authorization Act of 2005 (Public Law 109–155; 119 Stat. 2922; 51 U.S.C. 71101 note prec.).

(e) NEAR-EARTH OBJECT DEFINED.—In this section, the term ''near-Earth object'' means an asteroid or comet with a perihelion distance of less than 1.3 Astronomical Units from the Sun.

SEC. 310. SUBORBITAL SCIENCE FLIGHTS.

(a) SENSE OF CONGRESS.—It is the sense of Congress that commercially available suborbital flight platforms enable low-cost access to a microgravity environment to advance science and train scientists and engineers under the Suborbital Research Program established under section 802(c) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18382(c)).

(b) REPORT.—

(1) IN GENERAL.—Not later than 270 days after the date of the enactment of this Act, the Administrator shall submit to the appropriate committees of Congress a report evaluating the manner in which suborbital flight platforms can contribute to meeting the science objectives of NASA for the Science Mission Directorate and the Human Exploration and Operations Mission Directorate.

(2) CONTENTS.—The report required by paragraph (1) shall include the following:

(A) An assessment of the advantages of suborbital flight platforms to meet science objectives.

(B) An evaluation of the challenges to greater use of commercial suborbital flight platforms for science purposes.

(C) An analysis of whether commercial suborbital flight platforms can provide low-cost flight opportunities to test lunar and Mars science payloads.

SEC. 311. SENSE OF CONGRESS ON SMALL SATELLITE SCIENCE.

It is the sense of Congress that—

(1) small satellites—

(A) are increasingly robust, effective, and affordable platforms for carrying out space science missions;

(B) can work in tandem with or augment larger NASA spacecraft to support high-priority science missions of NASA; and

(C) are cost effective solutions that may allow NASA to continue collecting legacy observations while developing next generation science missions; and

(2) NASA should continue to support small satellite research, development, technologies, and programs, including technologies for compact and lightweight instrumentation for small satellites.

TITLE IV—AERONAUTICS

SEC. 401. SHORT TITLE.

This title may be cited as the ''Aeronautics Innovation Act''.

SEC. 402. DEFINITIONS.

In this title:

(1) AERONAUTICS STRATEGIC IMPLEMENTATION PLAN.—The term ''Aeronautics Strategic Implementation Plan'' means the Aeronautics Strategic Implementation Plan issued by the Aeronautics Research Mission Directorate.

(2) UNMANNED AIRCRAFT; UNMANNED AIRCRAFT SYSTEM.—The terms ''unmanned aircraft'' and ''unmanned aircraft system'' have the meanings given those terms in section 44801 of title 49, United States Code.

(3) X-PLANE.—The term ''X-plane'' means an experimental aircraft that is—

(A) used to test and evaluate a new technology or aerodynamic concept; and

(B) operated by NASA or the Department of Defense.

SEC. 403. EXPERIMENTAL AIRCRAFT PROJECTS.

(a) SENSE OF CONGRESS.—It is the sense of Congress that—

(1) developing high-risk, precompetitive aerospace technologies for which there is not yet a profit rationale is a fundamental role of NASA;

(2) large-scale piloted flight test experimentation and validation are necessary for—

(A) transitioning new technologies and materials, including associated manufacturing processes, for general aviation, commercial aviation, and military aeronautics use; and

(B) capturing the full extent of benefits from investments made by the Aeronautics Research Mission Directorate in priority programs called for in—

(i) the National Aeronautics Research and Development Plan issued by the National Science and Technology Council in February 2010;

(ii) the NASA 2014 Strategic Plan;

(iii) the Aeronautics Strategic Implementation Plan; and

(iv) any updates to the programs called for in the plans described in clauses (i) through (iii); and

(3) a level of funding that adequately supports large-scale piloted flight test experimentation and

validation, including related infrastructure, should be ensured over a sustained period of time to restore the capacity of NASA—

(A) to see legacy priority programs through to completion; and

(B) to achieve national economic and security objectives.

(b) STATEMENT OF POLICY.—It is the policy of the United States—

(1) to maintain world leadership in—

(A) military and civilian aeronautical science and technology;

(B) global air power projection; and

(C) industrialization; and

(2) to maintain as a fundamental objective of NASA aeronautics research the steady progression and expansion of flight research and capabilities, including the science and technology of critical underlying disciplines and competencies, such as—

(A) computational-based analytical and predictive tools and methodologies;

(B) aerothermodynamics;

(C) propulsion;

(D) advanced materials and manufacturing processes;

(E) high-temperature structures and materials; and

(F) guidance, navigation, and flight controls.

(c) ESTABLISHMENT AND CONTINUATION OF X-PLANE PROJECTS.—

(1) IN GENERAL.—The Administrator shall establish or continue to implement, in a manner that is consistent with the roadmap for supersonic aeronautics research and development required by section 604(b) of the National Aeronautics and Space Administration Transition Authorization Act of 2017 (Public Law 115–10; 131 Stat. 55), the following projects:

(A) A low-boom supersonic aircraft project to demonstrate supersonic aircraft designs and technologies that—

(i) reduce sonic boom noise; and

(ii) assist the Administrator of the Federal Aviation Administration in enabling—

(I) the safe commercial deployment of civil supersonic aircraft technology; and

~~(II) the safe and efficient operation of civil supersonic aircraft.~~

~~(B) A subsonic flight demonstrator aircraft project to advance aircraft designs and technologies that enable significant increases in energy efficiency and reduced life-cycle emissions in the aviation system while reducing noise and emissions.~~

~~(C) A series of large-scale X-plane demonstrators that are—~~

~~(i) developed sequentially or in parallel; and~~

~~(ii) each based on a set of new configuration concepts or technologies determined by the Administrator to demonstrate—~~

~~(I) aircraft and propulsion concepts and technologies and related advances in alternative propulsion and energy; and~~

~~(II) flight propulsion concepts and technologies.~~

~~(2) ELEMENTS.—For each project under paragraph (1), the Administrator shall—~~

(A) include the development of X-planes and all necessary supporting flight test assets;

(B) pursue a robust technology maturation and flight test validation effort;

(C) improve necessary facilities, flight testing capabilities, and computational tools to support the project;

(D) award any primary contracts for design, procurement, and manufacturing to United States persons, consistent with international obligations and commitments;

(E) coordinate research and flight test demonstration activities with other Federal agencies and the United States aviation community, as the Administrator considers appropriate; and

(F) ensure that the project is aligned with the Aeronautics Strategic Implementation Plan and any updates to the Aeronautics Strategic Implementation Plan.

(3) UNITED STATES PERSON DEFINED.—In this subsection, the term ''United States person'' means—

(A) a United States citizen or an alien lawfully admitted for permanent residence to the United States; or

(B) an entity organized under the laws of the United States or of any jurisdiction within the United States, including a foreign branch of such an entity.

(d) ADVANCED MATERIALS AND MANUFACTURING TECHNOLOGY PROGRAM.—

(1) IN GENERAL.—The Administrator may establish an advanced materials and manufacturing technology program—

(A) to develop—

(i) new materials, including composite and high-temperature materials, from base material formulation through full-scale structural validation and manufacture;

(ii) advanced materials and manufacturing processes, including additive manufacturing, to reduce the cost of manufacturing scale-up and certification for use in general aviation, commercial aviation, and military aeronautics; and

(iii) noninvasive or nondestructive techniques for testing or evaluating avia-

tion and aeronautics structures, including for materials and manufacturing processes;

(B) to reduce the time it takes to design, industrialize, and certify advanced materials and manufacturing processes;

(C) to provide education and training opportunities for the aerospace workforce; and

(D) to address global cost and human capital competitiveness for United States aeronautical industries and technological leadership in advanced materials and manufacturing technology.

(2) ELEMENTS.—In carrying out a program under paragraph (1), the Administrator shall—

(A) build on work that was carried out by the Advanced Composites Project of NASA;

(B) partner with the private and academic sectors, such as members of the Advanced Composites Consortium of NASA, the Joint Advanced Materials and Structures Center of Excellence of the Federal Aviation Administration, and national laboratories, as the Administrator considers appropriate;

(C) provide a structure for managing intellectual property generated by the program

based on or consistent with the structure established for the Advanced Composites Consortium of NASA;

(D) ensure adequate Federal cost share for applicable research; and

(E) coordinate with advanced manufacturing and composites initiatives in other mission directorates of NASA, as the Administrator considers appropriate.

(c) RESEARCH PARTNERSHIPS.—In carrying out the projects under subsection (c) and a program under subsection (d), the Administrator may engage in cooperative research programs with—

(1) academia; and

(2) commercial aviation and aerospace manufacturers.

SEC. 404. UNMANNED AIRCRAFT SYSTEMS.

(a) UNMANNED AIRCRAFT SYSTEMS OPERATION PROGRAM.—The Administrator shall—

(1) research and test capabilities and concepts, including unmanned aircraft systems communications and spectrum-related resources, for integrating unmanned aircraft systems into the national airspace system;

(2) leverage the partnership NASA has with industry focused on the advancement of technologies for future air traffic management systems for unmanned aircraft systems; and

(3) continue to align the research and testing portfolio of NASA to inform the integration of unmanned aircraft systems into the national airspace system, consistent with public safety and national security objectives.

(b) SENSE OF CONGRESS ON COORDINATION WITH FEDERAL AVIATION ADMINISTRATION.—It is the sense of Congress that—

(1) NASA should continue—

(A) to coordinate with the Federal Aviation Administration on research on air traffic management systems for unmanned aircraft systems; and

(B) to assist the Federal Aviation Administration in the integration of air traffic management systems for unmanned aircraft systems into the national airspace system; and

(2) the test ranges (as defined in section 44801 of title 49, United States Code) should continue to be leveraged for research on—

(A) air traffic management systems for unmanned aircraft systems; and

(B) the integration of such systems into the national airspace system.

SEC. 405. 21ST CENTURY AERONAUTICS CAPABILITIES INITIATIVE.

(a) IN GENERAL.—The Administrator may establish an initiative, to be known as the ''21st Century Aeronautics Capabilities Initiative'', within the Construction and Environmental Compliance and Restoration Account, to ensure that NASA possesses the infrastructure and capabilities necessary to conduct proposed flight demonstration projects across the range of NASA aeronautics interests.

(b) ACTIVITIES.—In carrying out the 21st Century Aeronautics Capabilities Initiative, the Administrator may carry out the following activities:

(1) Any investments the Administrator considers necessary to upgrade and create facilities for civil and national security aeronautics research to support advancements in—

(A) long-term foundational science and technology;

(B) advanced aircraft systems;

(C) air traffic management systems;

(D) fuel efficiency;

(E) electric propulsion technologies;

(F) system-wide safety assurance;

(G) autonomous aviation; and

(H) supersonic and hypersonic aircraft design and development.

(2) Any measures the Administrator considers necessary to support flight testing activities, including—

(A) continuous refinement and development of free-flight test techniques and methodologies;

(B) upgrades and improvements to real-time tracking and data acquisition; and

(C) such other measures relating to aeronautics research support and modernization as the Administrator considers appropriate to carry out the scientific study of the problems of flight, with a view to practical solutions for such problems.

SEC. 406. SENSE OF CONGRESS ON ON-DEMAND AIR TRANSPORTATION.

It is the sense of Congress that—

(1) greater use of high-speed air transportation, small airports, helipads, vertical flight infrastruc-

~~ture, and other aviation-related infrastructure can alleviate surface transportation congestion and support economic growth within cities;~~

~~(2) with respect to urban air mobility and related concepts, NASA should continue—~~

~~(A) to conduct research focused on concepts, technologies, and design tools; and~~

~~(B) to support the evaluation of advanced technologies and operational concepts that can be leveraged by—~~

~~(i) industry to develop future vehicles and systems; and~~

~~(ii) the Federal Aviation Administration to support vehicle safety and operational certification; and~~

~~(3) NASA should leverage ongoing efforts to develop advanced technologies to actively support the research needed for on-demand air transportation.~~

~~SEC. 407. SENSE OF CONGRESS ON HYPERSONIC TECHNOLOGY RESEARCH.~~

~~It is the sense of Congress that—~~

~~(1) hypersonic technology is critical to the development of advanced high-speed aerospace vehicles for both civilian and national security purposes;~~

(2) for hypersonic vehicles to be realized, research is needed to overcome technical challenges, including in propulsion, advanced materials, and flight performance in a severe environment;

(3) NASA plays a critical role in supporting fundamental hypersonic research focused on system design, analysis and validation, and propulsion technologies;

(4) NASA research efforts in hypersonic technology should complement research supported by the Department of Defense to the maximum extent practicable, since contributions from both agencies working in partnership with universities and industry are necessary to overcome key technical challenges;

(5) previous coordinated research programs between NASA and the Department of Defense enabled important progress on hypersonic technology;

(6) the commercial sector could provide flight platforms and other capabilities that are able to host and support NASA hypersonic technology research projects; and

(7) in carrying out hypersonic technology research projects, the Administrator should—

(A) focus research and development efforts on high-speed propulsion systems, reusable vehicle technologies, high-temperature materials, and systems analysis;

(B) coordinate with the Department of Defense to prevent duplication of efforts and of investments;

(C) include partnerships with universities and industry to accomplish research goals; and

(D) maximize public-private use of commercially available platforms for hosting research and development flight projects.

TITLE V—SPACE TECHNOLOGY

SEC. 501. SPACE TECHNOLOGY MISSION DIRECTORATE.

(a) SENSE OF CONGRESS.—It is the sense of Congress that an independent Space Technology Mission Directorate is critical to ensuring continued investments in the development of technologies for missions across the portfolio of NASA, including science, aeronautics, and human exploration.

(b) SPACE TECHNOLOGY MISSION DIRECTORATE.—The Administrator shall maintain a Space Technology Mission Directorate consistent with section 702 of the National Aeronautics and Space Administration Transition Authorization Act of 2017 (51 U.S.C. 20301 note).

SEC. 502. FLIGHT OPPORTUNITIES PROGRAM.

(a) SENSE OF CONGRESS.—It is the sense of Congress that the Administrator should provide flight opportunities for payloads to microgravity environments and suborbital altitudes as required by section 907(c) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18405(c)), as amended by subsection (b).

(b) ESTABLISHMENT.—Section 907(c) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18405(c)) is amended to read as follows:

''(c) ESTABLISHMENT.—

''(1) IN GENERAL.—The Administrator shall establish a Commercial Reusable Suborbital Research Program within the Space Technology Mission Directorate to fund—

''(A) the development of payloads for scientific research, technology development, and education;

''(B) flight opportunities for those payloads to microgravity environments and suborbital altitudes; and

''(C) transition of those payloads to orbital opportunities.

~~"(2) COMMERCIAL REUSABLE VEHICLE FLIGHTS.—In carrying out the Commercial Reusable Suborbital Research Program, the Administrator may fund engineering and integration demonstrations, proofs of concept, and educational experiments for flights of commercial reusable vehicles.~~

~~"(3) COMMERCIAL SUBORBITAL LAUNCH VEHICLES.—In carrying out the Commercial Reusable Suborbital Research Program, the Administrator may not fund the development of commercial suborbital launch vehicles.~~

~~"(4) WORKING WITH MISSION DIRECTORATES.—In carrying out the Commercial Reusable Suborbital Research Program, the Administrator shall work with the mission directorates of NASA to achieve the research, technology, and education goals of NASA.".~~

~~(c) CONFORMING AMENDMENT.—Section 907(b) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18405(b)) is amended, in the first sentence, by striking "Commercial Reusable Suborbital Research Program in" and inserting "Commercial Reusable Suborbital Research Program established under subsection (c)(1) within".~~

SEC. 503. SMALL SPACECRAFT TECHNOLOGY PROGRAM.

(a) SENSE OF CONGRESS.—It is the sense of Congress that the Small Spacecraft Technology Program is important for conducting science and technology validation for—

(1) short- and long-duration missions in low-Earth orbit; and

(2) deep space missions.

(b) ACCOMMODATION OF CERTAIN PAYLOADS.—In carrying out the Small Spacecraft Technology Program, the Administrator shall, as the mission risk posture and technology development objectives allow, accommodate science payloads that further the goal of long-term human exploration to the Moon and Mars.

SEC. 504. NUCLEAR PROPULSION TECHNOLOGY.

(a) SENSE OF CONGRESS.—It is the sense of Congress that nuclear propulsion is critical to the development of advanced spacecraft for civilian and national defense purposes.

(b) DEVELOPMENT; STUDIES.—The Administrator shall, in coordination with the Secretary of Energy and the Secretary of Defense—

(1) continue to develop the fuel element design for NASA nuclear propulsion technology;

(2) finalize the systems feasibility studies for such technology; and

(3) partner with members of commercial industry to conduct mission concept studies on such technology.

(c) NUCLEAR PROPULSION TECHNOLOGY DEMONSTRATION.—

(1) DETERMINATION; REPORT.—Not later than December 31, 2021, the Administrator shall—

(A) determine the correct approach for conducting a flight demonstration of nuclear propulsion technology; and

(B) submit to Congress a report on a plan for such a demonstration.

(2) DEMONSTRATION.—Not later than December 31, 2024, the Administrator shall conduct the flight demonstration described in paragraph (1).

SEC. 505. MARS-FORWARD TECHNOLOGIES.

(a) SENSE OF CONGRESS.—It is the sense of Congress that the Administrator should pursue multiple technical paths for entry, descent, and landing for Mars, including competitively selected technology demonstration missions.

(b) PRIORITIZATION OF LONG-LEAD TECHNOLOGIES AND SYSTEMS.—The Administrator shall prioritize, within the Space Technology Mission Directorate, research, testing, and development of long-lead technologies and sys-

tems for Mars, including technologies and systems relating to—

(1) entry, descent, and landing; and

(2) in-space propulsion, including nuclear propulsion, cryogenic fluid management, and electric propulsion options.

TITLE VI—STEM ENGAGEMENT

SEC. 601. SENSE OF CONGRESS.

It is the sense of Congress that—

(1) NASA serves as a source of inspiration to the people of the United States; and

(2) NASA is uniquely positioned to help increase student interest in science, technology, engineering, and math;

(3) engaging students, and providing hands-on experience at an early age, in science, technology, engineering, and math are important aspects of ensuring and promoting United States leadership in innovation; and

(4) NASA should strive to leverage its unique position—

(A) to increase kindergarten through grade 12 involvement in NASA projects;

(B) to enhance higher education in STEM fields in the United States;

(C) to support individuals who are underrepresented in science, technology, engineering, and math fields, such as women, minorities, and individuals in rural areas; and

(D) to provide flight opportunities for student experiments and investigations.

SEC. 602. STEM EDUCATION ENGAGEMENT ACTIVITIES.

(a) IN GENERAL.—The Administrator shall continue to provide opportunities for formal and informal STEM education engagement activities within the Office of NASA STEM Engagement and other NASA directorates, including—

(1) the Established Program to Stimulate Competitive Research;

(2) the Minority University Research and Education Project; and

(3) the National Space Grant College and Fellowship Program.

(b) LEVERAGING NASA NATIONAL PROGRAMS TO PROMOTE STEM EDUCATION.—The Administrator, in partnership with museums, nonprofit organizations, and commercial entities, shall, to the maximum extent practicable, leverage human spaceflight missions, Deep Space Exploration Systems (including the Space Launch System, Orion, and Exploration Ground Systems), and NASA

science programs to engage students at the kindergarten through grade 12 and higher education levels to pursue learning and career opportunities in STEM fields.

(c) BRIEFING.—Not later than 1 year after the date of the enactment of this Act, the Administrator shall brief the appropriate committees of Congress on—

(1) the status of the programs described in subsection (a); and

(2) the manner by which each NASA STEM education engagement activity is organized and funded.

(d) STEM EDUCATION DEFINED.—In this section, the term "STEM education" has the meaning given the term in section 2 of the STEM Education Act of 2015 (Public Law 114–59; 42 U.S.C. 6621 note).

SEC. 603. SKILLED TECHNICAL EDUCATION OUTREACH PROGRAM.

(a) ESTABLISHMENT.—The Administrator shall establish a program to conduct outreach to secondary school students—

(1) to expose students to careers that require career and technical education; and

(2) to encourage students to pursue careers that require career and technical education.

(b) OUTREACH PLAN.—Not later than 180 days after the date of the enactment of this Act, the Administrator shall submit to the appropriate committees of Congress a report on the outreach program under subsection (a) that includes—

(1) an implementation plan;

(2) a description of the resources needed to carry out the program; and

(3) any recommendations on expanding outreach to secondary school students interested in skilled technical occupations.

(c) SYSTEMS OBSERVATION.—

(1) IN GENERAL.—The Administrator shall develop a program and associated policies to allow students from accredited educational institutions to view the manufacturing, assembly, and testing of NASA-funded space and aeronautical systems, as the Administrator considers appropriate.

(2) CONSIDERATIONS.—In developing the program and policies under paragraph (1), the Administrator shall take into consideration factors such as workplace safety, mission needs, and the protection of sensitive and proprietary technologies.

TITLE VII—WORKFORCE AND INDUSTRIAL BASE

SEC. 701. APPOINTMENT AND COMPENSATION PILOT PROGRAM.

(a) DEFINITION OF COVERED PROVISIONS.—In this section the term ''covered provisions'' means the provisions of title 5, United States Code, other than—

(1) section 2301 of that title;

(2) section 2302 of that title;

(3) chapter 71 of that title;

(4) section 7204 of that title; and

(5) chapter 73 of that title.

(b) ESTABLISHMENT.—There is established a 3-year pilot program under which, notwithstanding section 20113 of title 51, United States Code, the Administrator may, with respect to not more than 5,000 designated personnel—

(1) appoint and manage such designated personnel of the Administration, without regard to the covered provisions; and

(2) fix the compensation of such designated personnel of the Administration, without regard to chapter 51 and subchapter III of chapter 53 of title 5, United States Code, at a rate that does not exceed the per annum rate of salary of the Vice Presi-

dent of the United States under section 104 of title 3, United States Code.

(c) ADMINISTRATOR RESPONSIBILITIES.—In carrying out the pilot program established under subsection (b), the Administrator shall ensure that the pilot program—

(1) uses—

(A) state-of-the-art recruitment techniques;

(B) simplified classification methods with respect to personnel of the Administration; and

(C) broad banding; and

(2) offers—

(A) competitive compensation; and

(B) the opportunity for career mobility.

SEC. 702. ESTABLISHMENT OF MULTI-INSTITUTION CONSORTIA AND UNIVERSITY-AFFILIATED RESEARCH CENTERS.

(a) IN GENERAL.—The Administrator, pursuant to section 2304(c)(3)(B) of title 10, United States Code, may—

(1) establish one or more multi-institution consortia or university-affiliated research centers to facilitate access to essential engineering, research, and development capabilities in support of NASA missions;

(2) use such a consortium or research center to fund technical analyses and other engineering support to address the acquisition, technical, and operational needs of NASA centers; and

(3) ensure such a consortium or research center—

(A) is held accountable for the technical quality of the work product developed under this section; and

(B) convenes disparate groups to facilitate public-private partnerships.

(b) POLICIES AND PROCEDURES.—The Administrator shall develop and implement policies and procedures to govern, with respect to the establishment of a consortium or research center under subsection (a)—

(1) the selection of participants;

(2) the award of cooperative agreements or other contracts;

(3) the appropriate use of competitive awards and sole source awards; and

(4) technical capabilities required.

(c) ELIGIBILITY.—The following entities shall be eligible to participate in a consortium or research center established under subsection (a)—

(1) an institution of higher education (as defined in section 102 of the Higher Education Act of 1965 (20 U.S.C. 1002));

(2) an operator of a federally funded research and development center;

(3) a nonprofit or not-for-profit research institution; and

(4) a consortium composed of—

(A) an entity described in paragraph (1), (2), or (3); and

(B) one or more for-profit entities.

SEC. 703. EXPEDITED ACCESS TO TECHNICAL TALENT AND EXPERTISE.

(a) IN GENERAL.—The Administrator may—

(1) establish one or more multi-institution task order contracts, consortia, cooperative agreements, or other arrangements to facilitate expedited access to eligible entities in support of NASA missions; and

(2) use such a multi-institution task order contract, consortium, cooperative agreement, or other arrangement to fund technical analyses and other engineering support to address the acquisition, technical, and operational needs of NASA centers.

(b) CONSULTATION WITH OTHER NASA-AFFILIATED ENTITIES.—To ensure access to technical expertise

and reduce costs and duplicative efforts, a multi-institution task order contract, consortium, cooperative agreement, or any other arrangement established under subsection (a)(1) shall, to the maximum extent practicable, be carried out in consultation with other NASA-affiliated entities, including federally funded research and development centers, university-affiliated research centers, and NASA laboratories and test centers.

(c) POLICIES AND PROCEDURES.—The Administrator shall develop and implement policies and procedures to govern, with respect to the establishment of a multi-institution task order contract, consortium, cooperative agreement, or any other arrangement under subsection (a)(1)—

(1) the selection of participants;

(2) the award of task orders;

(3) the maximum award size for a task;

(4) the appropriate use of competitive awards and sole source awards; and

(5) technical capabilities required.

(d) ELIGIBLE ENTITY DEFINED.—In this section, the term "eligible entity" means—

(1) an institution of higher education (as defined in section 102 of the Higher Education Act of 1965 (20 U.S.C. 1002));

(2) an operator of a federally funded research and development center;

(3) a nonprofit or not-for-profit research institution; and

(4) a consortium composed of—

(A) an entity described in paragraph (1), (2), or (3); and

(B) one or more for-profit entities.

SEC. 704. REPORT ON INDUSTRIAL BASE FOR CIVIL SPACE MISSIONS AND OPERATIONS.

(a) IN GENERAL.—Not later than 1 year after the date of the enactment of this Act, the Administrator shall submit to the appropriate committees of Congress a report on the United States industrial base for NASA civil space missions and operations.

(b) ELEMENTS.—The report required by subsection (a) shall include the following:

(1) A comprehensive description of the current status of the United States industrial base for NASA civil space missions and operations.

(2) A description and assessment of the weaknesses in the supply chain, skills, manufacturing capacity, raw materials, key components, and other areas of the United States industrial base for NASA civil space missions and operations that could ad-

versely impact such missions and operations if unavailable.

(3) A description and assessment of various mechanisms to address and mitigate the weaknesses described pursuant to paragraph (2).

(4) Such other matters relating to the United States industrial base for NASA civil space missions and operations as the Administrator considers appropriate.

SEC. 705. SEPARATIONS AND RETIREMENT INCENTIVES.

Section 20113 of title 51, United States Code, is amended by adding at the end the following:

''(o) PROVISIONS RELATED TO SEPARATION AND RETIREMENT INCENTIVES.—

''(1) DEFINITION.—In this subsection, the term 'employee'—

''(A) means an employee of the Administration serving under an appointment without time limitation; and

''(B) does not include—

''(i) a reemployed annuitant under subchapter III of chapter 83 or chapter 84 of title 5 or any other retirement system for employees of the Federal Government;

"(ii) an employee having a disability on the basis of which such employee is or would be eligible for disability retirement under any of the retirement systems referred to in clause (i); or

"(iii) for purposes of eligibility for separation incentives under this subsection, an employee who is in receipt of a decision notice of involuntary separation for misconduct or unacceptable performance.

"(2) AUTHORITY.—The Administrator may establish a program under which employees may be eligible for early retirement, offered separation incentive pay to separate from service voluntarily, or both. This authority may be used to reduce the number of personnel employed or to restructure the workforce to meet mission objectives without reducing the overall number of personnel. This authority is in addition to, and notwithstanding, any other authorities established by law or regulation for such programs.

"(3) EARLY RETIREMENT.—An employee who is at least 50 years of age and has completed 20 years of service, or has at least 25 years of service, may, pursuant to regulations promulgated under

this subsection, apply and be retired from the Administration and receive benefits in accordance with subchapter III of chapter 83 or 84 of title 5 if the employee has been employed continuously within the Administration for more than 30 days before the date on which the determination to conduct a reduction or restructuring within 1 or more Administration centers is approved.

''(4) SEPARATION PAY.—

''(A) IN GENERAL.—Separation pay shall be paid in a lump sum or in installments and shall be equal to the lesser of—

''(i) an amount equal to the amount the employee would be entitled to receive under section 5595(c) of title 5, if the employee were entitled to payment under such section; or

''(ii) $40,000.

''(B) LIMITATIONS.—Separation pay shall not be a basis for payment, and shall not be included in the computation, of any other type of Government benefit. Separation pay shall not be taken into account for the purpose of determining the amount of any severance pay to which an individual may be entitled under sec-

tion 5595 of title 5, based on any other separation.

''(C) INSTALLMENTS.—Separation pay, if paid in installments, shall cease to be paid upon the recipient's acceptance of employment by the Federal Government, or commencement of work under a personal services contract as described in paragraph (5).

''(5) LIMITATIONS ON REEMPLOYMENT.—

''(A) An employee who receives separation pay under such program may not be reemployed by the Administration for a 12-month period beginning on the effective date of the employee's separation, unless this prohibition is waived by the Administrator on a case-by-case basis.

''(B) An employee who receives separation pay under this section on the basis of a separation and accepts employment with the Government of the United States, or who commences work through a personal services contract with the United States within 5 years after the date of the separation on which payment of the separation pay is based, shall be required to repay the entire amount of the separation pay to the Administration. If the employment is with an

Executive agency (as defined by section 105 of title 5) other than the Administration, the Administrator may, at the request of the head of that agency, waive the repayment if the individual involved possesses unique abilities and is the only qualified applicant available for the position. If the employment is within the Administration, the Administrator may waive the repayment if the individual involved is the only qualified applicant available for the position. If the employment is with an entity in the legislative branch, the head of the entity or the appointing official may waive the repayment if the individual involved possesses unique abilities and is the only qualified applicant available for the position. If the employment is with the judicial branch, the Director of the Administrative Office of the United States Courts may waive the repayment if the individual involved possesses unique abilities and is the only qualified applicant available for the position.

"(6) REGULATIONS.—Under the program established under paragraph (2), early retirement and separation pay may be offered only pursuant to regulations established by the Administrator, subject to

such limitations or conditions as the Administrator may require.

''(7) USE OF EXISTING FUNDS.—The Administrator shall carry out this subsection using amounts otherwise made available to the Administrator and no additional funds are authorized to be appropriated to carry out this subsection.''.

SEC. 706. CONFIDENTIALITY OF MEDICAL QUALITY ASSURANCE RECORDS.

(a) IN GENERAL.—Chapter 313 of title 51, United States Code, is amended by adding at the end the following:

''§ 31303. Confidentiality of medical quality assurance records

''(a) IN GENERAL.—Except as provided in subsection (b)(1)—

''(1) a medical quality assurance record, or any part of a medical quality assurance record, may not be subject to discovery or admitted into evidence in a judicial or administrative proceeding; and

''(2) an individual who reviews or creates a medical quality assurance record for the Administration, or participates in any proceeding that reviews or creates a medical quality assurance record, may

not testify in a judicial or administrative proceeding with respect to—

"(A) the medical quality assurance record; or

"(B) any finding, recommendation, evaluation, opinion, or action taken by such individual or in accordance with such proceeding with respect to the medical quality assurance record.

"(b) DISCLOSURE OF RECORDS.—

"(1) IN GENERAL.—Notwithstanding subsection (a), a medical quality assurance record may be disclosed to—

"(A) a Federal agency or private entity, if the medical quality assurance record is necessary for the Federal agency or private entity to carry out—

"(i) licensing or accreditation functions relating to Administration healthcare facilities; or

"(ii) monitoring of Administration healthcare facilities required by law;

"(B) a Federal agency or healthcare provider, if the medical quality assurance record is required by the Federal agency or healthcare provider to enable Administration participation

in a healthcare program of the Federal agency or healthcare provider;

"(C) a criminal or civil law enforcement agency, or an instrumentality authorized by law to protect the public health or safety, on written request by a qualified representative of such agency or instrumentality submitted to the Administrator that includes a description of the lawful purpose for which the medical quality assurance record is requested;

"(D) an officer, an employee, or a contractor of the Administration who requires the medical quality assurance record to carry out an official duty associated with healthcare;

"(E) healthcare personnel, to the extent necessary to address a medical emergency affecting the health or safety of an individual; and

"(F) any committee, panel, or board convened by the Administration to review the healthcare-related policies and practices of the Administration.

"(2) SUBSEQUENT DISCLOSURE PROHIBITED.—An individual or entity to whom a medical quality assurance record has been disclosed under para-

graph (1) may not make a subsequent disclosure of the medical quality assurance record.

''(c) PERSONALLY IDENTIFIABLE INFORMATION.—

''(1) IN GENERAL.—Except as provided in paragraph (2), the personally identifiable information contained in a medical quality assurance record of a patient or an employee of the Administration, or any other individual associated with the Administration for purposes of a medical quality assurance program, shall be removed before the disclosure of the medical quality assurance record to an entity other than the Administration.

''(2) EXCEPTION.—Personally identifiable information described in paragraph (1) may be released to an entity other than the Administration if the Administrator makes a determination that the release of such personally identifiable information—

''(A) is in the best interests of the Administration; and

''(B) does not constitute an unwarranted invasion of personal privacy.

''(d) EXCLUSION FROM FOIA.—A medical quality assurance record may not be made available to any person under section 552 of title 5, United States Code (commonly referred to as the 'Freedom of Information Act'),

and this section shall be considered a statute described in subsection (b)(3)(B) of such section 522.

''(c) REGULATIONS.—Not later than one year after the date of the enactment of this section, the Administrator shall promulgate regulations to implement this section.

''(f) RULES OF CONSTRUCTION.—Nothing in this section shall be construed—

''(1) to withhold a medical quality assurance record from a committee of the Senate or House of Representatives or a joint committee of Congress if the medical quality assurance record relates to a matter within the jurisdiction of such committee or joint committee; or

''(2) to limit the use of a medical quality assurance record within the Administration, including the use by a contractor or consultant of the Administration.

''(g) DEFINITIONS.—In this section:

''(1) MEDICAL QUALITY ASSURANCE RECORD.—The term 'medical quality assurance record' means any proceeding, discussion, record, finding, recommendation, evaluation, opinion, minutes, report, or other document or action that results from a

quality assurance committee, quality assurance program, or quality assurance program activity.

''(2) QUALITY ASSURANCE PROGRAM.—

''(A) IN GENERAL.—The term 'quality assurance program' means a comprehensive program of the Administration—

''(i) to systematically review and improve the quality of medical and behavioral health services provided by the Administration to ensure the safety and security of individuals receiving such health services; and

''(ii) to evaluate and improve the efficiency, effectiveness, and use of staff and resources in the delivery of such health services.

''(B) INCLUSION.—The term 'quality assurance program' includes any activity carried out by or for the Administration to assess the quality of medical care provided by the Administration.''.

(b) TECHNICAL AND CONFORMING AMENDMENT.—The table of sections for chapter 313 of title 51, United States Code, is amended by adding at the end the following:

''31303. Confidentiality of medical quality assurance records.''.

TITLE VIII—MISCELLANEOUS PROVISIONS

SEC. 801. CONTRACTING AUTHORITY.

Section 20113 of title 51, United States Code, is amended by adding at the end the following:

''(o) CONTRACTING AUTHORITY.—The Administration—

''(1) may enter into an agreement with a private, commercial, or State government entity to provide the entity with supplies, support, and services related to private, commercial, or State government space activities carried out at a property owned or operated by the Administration; and

''(2) upon the request of such an entity, may include such supplies, support, and services in the requirements of the Administration if—

''(A) the Administrator determines that the inclusion of such supplies, support, or services in such requirements—

''(i) is in the best interest of the Federal Government;

''(ii) does not interfere with the requirements of the Administration; and

''(iii) does not compete with the commercial space activities of other such entities; and

''(B) the Administration has full reimbursable funding from the entity that requested supplies, support, and services prior to making any obligation for the delivery of such supplies, support, or services under an Administration procurement contract or any other agreement.''.

SEC. 802. AUTHORITY FOR TRANSACTION PROTOTYPE PROJECTS AND FOLLOW-ON PRODUCTION CONTRACTS.

Section 20113 of title 51, United States Code, as amended by section 801, is further amended by adding at the end the following:

''(p) TRANSACTION PROTOTYPE PROJECTS AND FOLLOW-ON PRODUCTION CONTRACTS.—

''(1) IN GENERAL.—The Administration may enter into a transaction (other than a contract, cooperative agreement, or grant) to carry out a prototype project that is directly relevant to enhancing the mission effectiveness of the Administration.

''(2) SUBSEQUENT AWARD OF FOLLOW-ON PRODUCTION CONTRACT.—A transaction entered into under this subsection for a prototype project may

provide for the subsequent award of a follow-on production contract to participants in the transaction.

"(3) INCLUSION.—A transaction under this subsection includes a project awarded to an individual participant and to all individual projects awarded to a consortium of United States industry and academic institutions.

"(4) DETERMINATION.—The authority of this section may be exercised for a transaction for a prototype project and any follow-on production contract, upon a determination by the head of the contracting activity, in accordance with Administration policies, that—

"(A) circumstances justify use of a transaction to provide an innovative business arrangement that would not be feasible or appropriate under a contract; and

"(B) the use of the authority of this section is essential to promoting the success of the prototype project.

"(5) COMPETITIVE PROCEDURE.—

"(A) IN GENERAL.—To the maximum extent practicable, the Administrator shall use competitive procedures with respect to entering

into a transaction to carry out a prototype project.

''(B) EXCEPTION.—Notwithstanding section 2304 of title 10, United States Code, a follow-on production contract may be awarded to the participants in the prototype transaction without the use of competitive procedures, if—

''(i) competitive procedures were used for the selection of parties for participation in the prototype transaction; and

''(ii) the participants in the transaction successfully completed the prototype project provided for in the transaction.

''(6) COST SHARE.—A transaction to carry out a prototype project and a follow-on production contract may require that part of the total cost of the transaction or contract be paid by the participant or contractor from a source other than the Federal Government.

''(7) PROCUREMENT ETHICS.—A transaction under this authority shall be considered an agency procurement for purposes of chapter 21 of title 41, United States Code, with regard to procurement ethics.''.

SEC. 803. PROTECTION OF DATA AND INFORMATION FROM PUBLIC DISCLOSURE.

(a) CERTAIN TECHNICAL DATA.—Section 20131 of title 51, United States Code, is amended—

(1) by redesignating subsection (c) as subsection (d);

(2) in subsection (a)(3), by striking ''subsection (b)'' and inserting ''subsection (b) or (c)'';

(3) by inserting after subsection (b) the following:

''(c) SPECIAL HANDLING OF CERTAIN TECHNICAL DATA.—

''(1) IN GENERAL.—The Administrator may provide appropriate protections against the public dissemination of certain technical data, including exemption from subchapter II of chapter 5 of title 5.

''(2) DEFINITIONS.—In this subsection:

''(A) CERTAIN TECHNICAL DATA.—The term 'certain technical data' means technical data that may not be exported lawfully outside the United States without approval, authorization, or license under—

''(i) the Export Control Reform Act of 2018 (Public Law 115–232; 132 Stat. 2208); or

''(ii) the International Security Assistance and Arms Export Control Act of 1976 (Public Law 94–329; 90 Stat. 729).

''(B) TECHNICAL DATA.—The term 'technical data' means any blueprint, drawing, photograph, plan, instruction, computer software, or documentation, or any other technical information.'';

(4) in subsection (d), as so redesignated, by inserting '', including any data,'' after ''information''; and

(5) by adding at the end the following:

''(e) EXCLUSION FROM FOIA.—This section shall be considered a statute described in subsection (b)(3)(B) of section 552 of title 5 (commonly referred to as the 'Freedom of Information Act').''.

(b) CERTAIN VOLUNTARILY PROVIDED SAFETY-RELATED INFORMATION.—

(1) IN GENERAL.—The Administrator shall provide appropriate safeguards against the public dissemination of safety-related information collected as part of a mishap investigation carried out under the NASA safety reporting system or in conjunction with an organizational safety assessment, if the Ad-

ministrator makes a written determination, including a justification of the determination, that—

(A)(i) disclosure of the information would inhibit individuals from voluntarily providing safety-related information; and

(ii) the ability of NASA to collect such information improves the safety of NASA programs and research relating to aeronautics and space; or

(B) withholding such information from public disclosure improves the safety of such NASA programs and research.

(2) OTHER FEDERAL AGENCIES.—Notwithstanding any other provision of law, if the Administrator provides to the head of another Federal agency safety-related information with respect to which the Administrator has made a determination under paragraph (1), the head of the Federal agency shall withhold the information from public disclosure.

(3) PUBLIC AVAILABILITY.—A determination under paragraph (1) shall be made available to the public on request, as required under section 552 of title 5, United States Code (commonly referred to as the "Freedom of Information Act").

(4) EXCLUSION FROM FOIA.—This subsection shall be considered a statute described in subsection (b)(3)(B) of section 552 of title 5, United States Code.

SEC. 804. PHYSICAL SECURITY MODERNIZATION.

Chapter 201 of title 51, United States Code, is amended—

(1) in section 20133(2), by striking ''property'' and all that follows through ''to the United States,'' and inserting ''Administration personnel or of property owned or leased by, or under the control of, the United States''; and

(2) in section 20134, in the second sentence—

(A) by inserting ''Administration personnel or any'' after ''protecting''; and

(B) by striking '', at facilities owned or contracted to the Administration''.

SEC. 805. LEASE OF NON-EXCESS PROPERTY.

Section 20145 of title 51, United States Code, is amended—

(1) in paragraph (b)(1)(B), by striking ''entered into for the purpose of developing renewable energy production facilities''; and

(2) by striking subsection (g).

SEC. 806. CYBERSECURITY.

(a) IN GENERAL.—Section 20301 of title 51, United States Code, is amended by adding at the end the following:

''(c) CYBERSECURITY.—The Administrator shall update and improve the cybersecurity of NASA space assets and supporting infrastructure.''.

(b) SECURITY OPERATIONS CENTER.—

(1) ESTABLISHMENT.—The Administrator shall maintain a Security Operations Center, to identify and respond to cybersecurity threats to NASA information technology systems, including institutional systems and mission systems.

(2) INSPECTOR GENERAL RECOMMENDATIONS.—The Administrator shall implement, to the maximum extent practicable, each of the recommendations contained in the report of the Inspector General of NASA entitled ''Audit of NASA's Security Operations Center'', issued on May 23, 2018.

(c) CYBER THREAT HUNT.—

(1) IN GENERAL.—The Administrator, in coordination with the Secretary of Homeland Security and the heads of other relevant Federal agencies, may implement a cyber threat hunt capability to proactively search NASA information systems for

advanced cyber threats that otherwise evade existing security tools.

(2) THREAT-HUNTING PROCESS.—In carrying out paragraph (1), the Administrator shall develop and document a threat-hunting process, including the roles and responsibilities of individuals conducting a cyber threat hunt.

(d) GAO PRIORITY RECOMMENDATIONS.—The Administrator shall implement, to the maximum extent practicable, the recommendations for NASA contained in the report of the Comptroller General of the United States entitled ''Information Security: Agencies Need to Improve Controls over Selected High-Impact Systems'', issued May 18, 2016, including—

(1) re-evaluating security control assessments; and

(2) specifying metrics for the continuous monitoring strategy of the Administration.

SEC. 807. LIMITATION ON COOPERATION WITH THE PEOPLE'S REPUBLIC OF CHINA.

(a) IN GENERAL.—Except as provided by subsection (b), the Administrator, the Director of the Office of Science and Technology Policy, and the Chair of the National Space Council, shall not—

~~(1) develop, design, plan, promulgate, implement, or execute a bilateral policy, program, order, or contract of any kind to participate, collaborate, or coordinate bilaterally in any manner with—~~

~~(A) the Government of the People's Republic of China; or~~

~~(B) any company—~~

~~(i) owned by the Government of the People's Republic of China; or~~

~~(ii) incorporated under the laws of the People's Republic of China; and~~

~~(2) host official visitors from the People's Republic of China at a facility belonging to or used by NASA.~~

~~(b) WAIVER.—~~

~~(1) IN GENERAL.—The Administrator, the Director, or the Chair may waive the limitation under subsection (a) with respect to an activity described in that subsection only if the Administrator, the Director, or the Chair, as applicable, makes a determination that the activity—~~

~~(A) does not pose a risk of a transfer of technology, data, or other information with national security or economic security implications~~

to an entity described in paragraph (1) of such subsection; and

(B) does not involve knowing interactions with officials who have been determined by the United States to have direct involvement with violations of human rights.

(2) CERTIFICATION TO CONGRESS.—Not later than 30 days after the date on which a waiver is granted under paragraph (1), the Administrator, the Director, or the Chair, as applicable, shall submit to the Committee on Commerce, Science, and Transportation and the Committee on Appropriations of the Senate and the Committee on Science, Space, and Technology and the Committee on Appropriations of the House of Representatives a written certification that the activity complies with the requirements in subparagraphs (A) and (B) of that paragraph.

SEC. 808. SMALL SATELLITE LAUNCH SERVICES PROGRAM.

(a) IN GENERAL.—The Administrator shall continue to procure dedicated launch services for small satellites, including CubeSats, for the purpose of conducting science and technology missions that further the goals of NASA.

(b) REQUIREMENTS.—In carrying out the program under subsection (a), the Administrator shall—

(1) engage with the academic community to maximize awareness and use of dedicated small satellite launch opportunities; and

(2) to the maximum extent practicable, use a secondary payload of procured launch services for CubeSats.

SEC. 809. 21ST CENTURY SPACE LAUNCH INFRASTRUCTURE.

(a) IN GENERAL.—The Administrator shall carry out a program to modernize launch infrastructure at NASA facilities—

(1) to enhance safety; and

(2) to advance Government and commercial space transportation and exploration.

(b) PROJECTS.—Projects funded under the program under subsection (a) may include—

(1) infrastructure relating to commodities;

(2) standard interfaces to meet customer needs for multiple payload processing and launch vehicle processing;

(3) enhancements to range capacity and flexibility; and

(4) such other projects as the Administrator considers appropriate to meet the goals described in subsection (a).

(c) REQUIREMENTS.—In carrying out the program under subsection (a), the Administrator shall—

(1) prioritize investments in projects that can be used by multiple users and launch vehicles, including non-NASA users and launch vehicles; and

(2) limit investments to projects that would not otherwise be funded by a NASA program, such as an institutional or programmatic infrastructure program.

(d) SAVINGS CLAUSE.—Nothing in this section shall preclude a NASA program, including the Space Launch System and Orion, from using the launch infrastructure modernized under this section.

SEC. 810. MISSIONS OF NATIONAL NEED.

(a) SENSE OF CONGRESS.—It is the Sense of Congress that—

(1) while certain space missions, such as asteroid detection or space debris mitigation missions, may not provide the highest-value science, as determined by the National Academies of Science, Engineering, and Medicine decadal surveys, such missions provide tremendous value to the United States and the world; and

~~(2) the current organizational and funding structure of NASA has not prioritized the funding of missions of national need.~~

~~(b) STUDY.—~~

~~(1) IN GENERAL.—The Director of the Office of Science and Technology Policy shall conduct a study on the manner in which NASA funds missions of national need.~~

~~(2) MATTERS TO BE INCLUDED.—The study conducted under paragraph (1) shall include the following:~~

~~(A) An identification and assessment of the types of missions or technology development programs that constitute missions of national need.~~

~~(B) An assessment of the manner in which such missions are currently funded and managed by NASA.~~

~~(C) An analysis of the options for funding missions of national need, including—~~

~~(i) structural changes required to allow NASA to fund such missions; and~~

~~(ii) an assessment of the capacity of other Federal agencies to make funds available for such missions.~~

(c) REPORT TO CONGRESS.—Not later than 1 year after the date of the enactment of this Act, the Director of the Office of Science and Technology Policy shall submit to the appropriate committees of Congress a report on the results of the study conducted under subsection (b), including recommendations for funding missions of national need.

SEC. 811. EXEMPTION FROM THE IRAN, NORTH KOREA, AND SYRIA NONPROLIFERATION ACT.

Section 7(1) of the Iran, North Korea, and Syria Nonproliferation Act (Public Law 106–178; 50 U.S.C. 1701 note) is amended, in the undesignated matter following subparagraph (B), by striking ''December 31, 2020'' and inserting ''December 31, 2030''.

SEC. 812. DRINKING WATER WELL REPLACEMENT FOR CHINCOTEAGUE, VIRGINIA.

Notwithstanding any other provision of law, during the 5-year period beginning on the date of the enactment of this Act, the Administrator may enter into 1 or more agreements with the town of Chincoteague, Virginia, to reimburse the town for costs that are directly associated with—

(1) the removal of drinking water wells located on property administered by the Administration; and

(2) the relocation of such wells to property under the administrative control, through lease, ownership, or easement, of the town.

SEC. 813. PASSENGER CARRIER USE.

Section 1344(a)(2) of title 31, United States Code, is amended—

(1) in subparagraph (A), by striking ''or'' at the end;

(2) in subparagraph (B), by inserting ''or'' after the comma at the end; and

(3) by inserting after subparagraph (B) the following:

''(C) necessary for post-flight transportation of United States Government astronauts subject to reimbursable arrangements returning from space for the performance of medical research, monitoring, diagnosis, or treatment, or other official duties, prior to receiving post-flight medical clearance to operate a motor vehicle,''.

SEC. 814. SBIR PHASE FLEXIBILITY FOR THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION.

Section 9(cc) of the Small Business Act (15 U.S.C. 638(cc)) is amended by inserting ''the National Aeronautics and Space Administration,'' after ''through 2022,''.

SECTION 1. SHORT TITLE; TABLE OF CONTENTS.

(a) SHORT TITLE.—This Act may be cited as the "National Aeronautics and Space Administration Authorization Act of 2019".

(b) TABLE OF CONTENTS.—The table of contents of this Act is as follows:

SEC. 2. DEFINITIONS.

In this Act:

(1) ADMINISTRATION.—The term "Administration" means the National Aeronautics and Space Administration.

(2) ADMINISTRATOR.—The term "Administrator" means the Administrator of the National Aeronautics and Space Administration.

(3) APPROPRIATE COMMITTEES OF CONGRESS.—Except as otherwise expressly provided, the term "appropriate committees of Congress" means—

(A) the Committee on Commerce, Science, and Transportation of the Senate; and

(B) the Committee on Science, Space, and Technology of the House of Representatives.

(4) CISLUNAR SPACE.—The term "cislunar space" means the region of space beyond low-Earth

orbit out to and including the region around the surface of the Moon.

(5) DEEP SPACE.—The term "deep space" means the region of space beyond low-Earth orbit, including cislunar space.

(6) DEVELOPMENT COST.—The term "development cost" has the meaning given the term in section 30104 of title 51, United States Code.

(7) ISS.—The term "ISS" means the International Space Station.

(8) ISS MANAGEMENT ENTITY.—The term "ISS management entity" means the organization with which the Administrator has entered into a cooperative agreement under section 504(a) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18354(a)).

(9) NASA.—The term "NASA" means the National Aeronautics and Space Administration.

(10) ORION.—The term "Orion" means the multipurpose crew vehicle described in section 303 of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18323).

(11) OSTP.—The term "OSTP" means the Office of Science and Technology Policy.

(12) SPACE LAUNCH SYSTEM.—The term "Space Launch System" means the Space Launch System authorized under section 302 of the National Aeronautics and Space Administration Act of 2010 (42 U.S.C. 18322).

TITLE I—AUTHORIZATION OF APPROPRIATIONS

SEC. 101. AUTHORIZATION OF APPROPRIATIONS.

There are authorized to be appropriated to the Administration for fiscal year 2020 $22,750,000,000 as follows:

(1) For Exploration, $6,222,600,000.

(2) For Space Operations, $4,150,200,000.

(3) For Science, $6,905,700,000.

(4) For Aeronautics, $783,900,000.

(5) For Space Technology, $1,076,400,000.

(6) For Science, Technology, Engineering, and Mathematics Engagement, $112,000,000.

(7) For Safety, Security, and Mission Services, $2,934,800,000.

(8) For Construction and Environmental Compliance and Restoration, $524,400,000.

(9) For Inspector General, $40,000,000.

TITLE II—HUMAN SPACEFLIGHT AND EXPLORATION

SEC. 201. ADVANCED CISLUNAR AND LUNAR SURFACE CAPABILITIES.

(a) SENSE OF CONGRESS.—It is the sense of Congress that—

(1) commercial entities in the United States have made significant investment and progress toward the development of human-class lunar landers;

(2) NASA developed the Artemis program—

(A) to fulfill the goal of landing United States astronauts, including the first woman and the next man, on the Moon; and

(B) to collaborate with commercial and international partners to establish sustainable lunar exploration by 2028; and

(3) in carrying out the Artemis program, the Administration should ensure that the entire Artemis program is inclusive and representative of all people of the United States, including women and minorities.

(b) LANDER PROGRAM.—

(1) IN GENERAL.—The Administrator shall foster the flight demonstration of not more than 2 human-

class lunar lander designs through public-private partnerships.

(2) INITIAL DEVELOPMENT PHASE.—The Administrator may support the formulation of more than 2 concepts in the initial development phase.

(c) REQUIREMENTS.—In carrying out the program under subsection (b), the Administrator shall—

(1) enter into industry-led partnerships using a fixed-price, milestone-based approach;

(2) to the maximum extent practicable, encourage reusability and sustainability of systems developed;

(3) ensure availability of 1 or more lunar polar science payloads for a demonstration mission; and

(4) to the maximum extent practicable, offer existing capabilities and assets of NASA centers to support these partnerships.

SEC. 202. SPACE LAUNCH SYSTEM CONFIGURATIONS.

(a) MOBILE LAUNCH PLATFORM.—The Administrator is authorized to maintain 2 operational mobile launch platforms to enable the launch of multiple configurations of the Space Launch System.

(b) EXPLORATION UPPER STAGE.—To meet the capability requirements under section 302(c)(2) of the National Aeronautics and Space Administration Authorization Act

of 2010 (42 U.S.C. 18322(c)(2)), the Administrator shall continue development of the Exploration Upper Stage for the Space Launch System with a scheduled availability sufficient for use on the third launch of the Space Launch System.

(c) BRIEFING.—Not later than 90 days after the date of the enactment of this Act, the Administrator shall brief the appropriate committees of Congress on the development and scheduled availability of the Exploration Upper Stage for the third launch of the Space Launch System.

(d) MAIN PROPULSION TEST ARTICLE.—To meet the requirements under section 302(c)(3) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18322(c)(3)), the Administrator shall—

(1) immediately on completion of the first full-duration integrated core stage test of the Space Launch System, initiate development of a main propulsion test article for the integrated core stage propulsion elements of the Space Launch System;

(2) not later than 180 days after the date of the enactment of this Act, submit to the appropriate committees of Congress a detailed plan for the development and operation of such main propulsion test article; and

(3) use existing capabilities of NASA centers for the design, manufacture, and operation of the main propulsion test article.

SEC. 203. ADVANCED SPACESUITS.

(a) SENSE OF CONGRESS.—It is the sense of Congress that next-generation advanced spacesuits are a critical technology for human space exploration and use of low-Earth orbit, cislunar space, the surface of the Moon, and Mars.

(b) DEVELOPMENT PLAN.—The Administrator shall establish a detailed plan for the development and manufacture of advanced spacesuits, consistent with the deep space exploration goals and timetables of NASA.

(c) DIVERSE ASTRONAUT CORPS.—The Administrator shall ensure that spacesuits developed and manufactured after the date of the enactment of this Act are capable of accommodating a wide range of sizes of astronauts so as to meet the needs of the diverse NASA astronaut corps.

(d) ISS USE.—Throughout the operational life of the ISS, the Administrator should fully use the ISS for testing advanced spacesuits.

(e) PRIOR INVESTMENTS.—

(1) IN GENERAL.—In developing an advanced spacesuit, the Administrator shall, to the maximum extent practicable, partner with industry-proven spacesuit design, development, and manufacturing

suppliers and leverage prior and existing investments in advanced spacesuit technologies to maximize the benefits of such investments and technologies.

(2) AGREEMENTS WITH PRIVATE ENTITIES.—In carrying out this subsection, the Administrator may enter into 1 or more agreements with 1 or more private entities for the manufacture of advanced spacesuits, as the Administrator considers appropriate.

(f) BRIEFING.—Not later than 180 days after the date of the enactment of this Act, and semiannually thereafter until NASA procures advanced spacesuits under this section, the Administrator shall brief the appropriate committees of Congress on the development plan in subsection (b).

SEC. 204. LIFE SCIENCE AND PHYSICAL SCIENCE RESEARCH.

(a) SENSE OF CONGRESS.—It is the sense of Congress that—

(1) the 2011 decadal survey on biological and physical sciences in space identifies—

(A) many areas in which fundamental scientific research is needed to efficiently advance the range of human activities in space, from the first stages of exploration to eventual economic development; and

(B) many areas of basic and applied scientific research that could use the microgravity, radiation, and other aspects of the spaceflight environment to answer fundamental scientific questions;

(2) given the central role of life science and physical science research in developing the future of space exploration, NASA should continue to invest strategically in such research to maintain United States leadership in space exploration; and

(3) such research remains important to the objectives of NASA with respect to long-duration deep space human exploration to the Moon and Mars.

(b) PROGRAM CONTINUATION.—

(1) IN GENERAL.—In support of the goals described in section 20302 of title 51, United States Code, the Administrator shall continue to implement a collaborative, multidisciplinary life science and physical science fundamental research program—

(A) to build a scientific foundation for the exploration and development of space;

(B) to investigate the mechanisms of changes to biological systems and physical systems, and the environments of those systems in space, including the effects of long-duration expo-

sure to deep space-related environmental factors on those systems;

(C) to understand the effects of combined deep space radiation and altered gravity levels on biological systems so as to inform the development and testing of potential countermeasures;

(D) to understand physical phenomena in reduced gravity that affect design and performance of enabling technologies necessary for the space exploration program;

(E) to provide scientific opportunities to educate, train, and develop the next generation of researchers and engineers; and

(F) to provide state-of-the-art data repositories and curation of large multi-data sets to enable comparative research analyses.

(2) ELEMENTS.—The program under paragraph (1) shall—

(A) include fundamental research relating to life science, space bioscience, and physical science; and

(B) maximize intra-agency and interagency partnerships to advance space exploration, scientific knowledge, and benefits to Earth.

(3) USE OF FACILITIES.—In carrying out the program under paragraph (1), the Administrator may use ground-based, air-based, and space-based facilities in low-Earth orbit and beyond low-Earth orbit.

SEC. 205. ACQUISITION OF DOMESTIC SPACE TRANSPORTATION AND LOGISTICS RESUPPLY SERVICES.

(a) IN GENERAL.—Except as provided in subsection (b), the Administrator shall not enter into any contract with a person or entity that proposes to use, or will use, a foreign launch provider for a commercial service to provide space transportation or logistics resupply for—

(1) the ISS; or

(2) any Government-owned or Government-funded platform in Earth orbit or cislunar space, on the lunar surface, or elsewhere in space.

(b) EXCEPTION.—The Administrator may enter into a contract with a person or entity that proposes to use, or will use, a foreign launch provider for a commercial service to carry out an activity described in subsection (a) if a domestic vehicle or service is unavailable.

(c) RULE OF CONSTRUCTION.—Nothing in this section shall be construed to prohibit the Administrator from entering into 1 or more no-exchange-of-funds collaborative agree-

ments with an international partner in support of the deep space exploration plan of NASA.

SEC. 206. ROCKET ENGINE TEST INFRASTRUCTURE.

(a) IN GENERAL.—The Administrator shall carry out a program to modernize rocket propulsion test infrastructure at NASA facilities—

(1) to increase capabilities;

(2) to enhance safety;

(3) to support propulsion development and testing; and

(4) to foster the improvement of Government and commercial space transportation and exploration.

(b) PROJECTS.—Projects funded under the program under subsection (a) may include—

(1) infrastructure and other facilities and systems relating to rocket propulsion test stands and rocket propulsion testing;

(2) enhancements to test facility capacity and flexibility; and

(3) such other projects as the Administrator considers appropriate to meet the goals described in subsection (a).

(c) REQUIREMENTS.—In carrying out the program under subsection (a), the Administrator shall—

(1) prioritize investments in projects that enhance test and flight certification capabilities for large thrust-level atmospheric and altitude engines and engine systems, and multi-engine integrated test capabilities; and

(2) ensure that no project carried out under this program shall adversely impact, delay, or defer testing or other activities associated with facilities used for Government programs, including—

(A) the Space Launch System and the Exploration Upper Stage of the Space Launch System;

(B) in-space propulsion to support exploration missions; or

(C) nuclear propulsion testing.

(d) SAVINGS CLAUSE.—Nothing in this section shall preclude a NASA program, including the Space Launch System and the Exploration Upper Stage of the Space Launch System, from using the modernized test infrastructure developed under this section.

SEC. 207. INDIAN RIVER BRIDGE.

(a) IN GENERAL.—The Administrator, in coordination with the heads of other Federal agencies that use the Indian River Bridge on the NASA Causeway, shall develop a plan to ensure that a bridge over the Indian River at such loca-

tion provides access to the Eastern Range for national security, civil, and commercial space operations.

(b) FEE OR TOLL DISCOURAGED.—The plan shall strongly discourage the imposition of a user fee or toll on a bridge over the Indian River at such location.

SEC. 208. VALUE OF INTERNATIONAL SPACE STATION AND CAPABILITIES IN LOW-EARTH ORBIT.

(a) SENSE OF CONGRESS.—It is the sense of Congress that—

(1) it is in the national and economic security interests of the United States to maintain a continuous human presence in low-Earth orbit;

(2) low-Earth orbit should be used as a test bed to advance human space exploration and scientific discoveries; and

(3) the ISS is a critical component of economic, commercial, and industrial development in low-Earth orbit.

(b) HUMAN PRESENCE REQUIREMENT.—The United States shall continuously maintain the capability for a continuous human presence in low-Earth orbit through and beyond the useful life of the ISS.

SEC. 209. EXTENSION AND MODIFICATION RELATING TO INTERNATIONAL SPACE STATION.

(a) POLICY.—Section 501(a) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18351(a)) is amended by striking "2024" and inserting "2030".

(b) MAINTENANCE OF UNITED STATES SEGMENT AND ASSURANCE OF CONTINUED OPERATIONS.—Section 503(a) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18353(a)) is amended by striking "September 30, 2024" and inserting "September 30, 2030".

(c) RESEARCH CAPACITY ALLOCATION AND INTEGRATION OF RESEARCH PAYLOADS.—Section 504(d) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18354(d)) is amended—

(1) in paragraph (1), in the first sentence—

(A) by striking "As soon as practicable" and all that follows through "2011," and inserting "The"; and

(B) by striking "September 30, 2024" and inserting "September 30, 2030"; and

(2) in paragraph (2), in the third sentence, by striking "September 30, 2024" and inserting "September 30, 2030".

(d) MAINTENANCE OF USE.—

(1) IN GENERAL.—Section 70907 of title 51, United States Code, is amended—

*(A) in the section heading, by striking "**2024**" and inserting "**2030**";*

(B) in subsection (a), by striking "September 30, 2024" and inserting "September 30, 2030"; and

(C) in subsection (b)(3), by striking "September 30, 2024" and inserting "September 30, 2030".

(e) TRANSITION PLAN REPORTS.—Section 50111(c)(2) of title 51, United States Code is amended—

(1) in the matter preceding subparagraph (A), by striking "2023" and inserting "2028"; and

(2) in subparagraph (J), by striking "2028" and inserting "2030".

(f) ELIMINATION OF INTERNATIONAL SPACE STATION NATIONAL LABORATORY ADVISORY COMMITTEE.—Section 70906 of title 51, United States Code, is repealed.

(g) CONFORMING AMENDMENTS.—Chapter 709 of title 51, United States Code, is amended—

(1) by redesignating section 70907 as section 70906; and

(2) in the table of sections for the chapter, by striking the items relating to sections 70906 and 70907 and inserting the following:

"70906. Maintaining use through at least 2030.".

SEC. 210. DEPARTMENT OF DEFENSE ACTIVITIES ON INTERNATIONAL SPACE STATION.

(a) IN GENERAL.—Not later than March 1, 2020, the Secretary of Defense shall—

(1) identify and review each activity, program, and project of the Department of Defense completed, being carried out, or planned to be carried out on the ISS as of the date of the review; and

(2) provide to the appropriate committees of Congress a briefing that describes the results of the review.

(b) APPROPRIATE COMMITTEES OF CONGRESS DEFINED.—In this section, the term "appropriate committees of Congress" means—

(1) the Committee on Armed Services and the Committee on Commerce, Science, and Transportation of the Senate; and

(2) the Committee on Armed Services and the Committee on Science, Space, and Technology of the House of Representatives.

SEC. 211. LOW-EARTH ORBIT COMMERCIALIZATION.

(a) STATEMENT OF POLICY.—It is the policy of the United States to encourage the development of a thriving and robust United States commercial sector in low-Earth orbit.

(b) PREFERENCE FOR UNITED STATES COMMERCIAL PRODUCTS AND SERVICES.—The Administrator shall continue to increase the use of assets, products, and services of private entities in the United States to fulfill the low-Earth orbit requirements of the Administration.

(c) NONCOMPETITION.—

(1) IN GENERAL.—Except as provided in paragraph (2), the Administrator may not offer to a foreign person or a foreign government a spaceflight product or service relating to the ISS, if a comparable spaceflight product or service, as applicable, is offered by a private entity in the United States.

(2) EXCEPTION.—The Administrator may offer a spaceflight product or service relating to the ISS to the government of a country that is a signatory to the Agreement Among the Government of Canada, Governments of Member States of the European Space Agency, the Government of Japan, the Government of the Russian Federation, and the Government of the United States of America Concerning Cooperation on the Civil International Space Station, signed at

Washington January 29, 1998, and entered into force on March 27, 2001 (TIAS 12927).

(d) SHORT-DURATION COMMERCIAL MISSIONS.—To provide opportunities for additional transport of astronauts to the ISS and help establish a commercial market in low-Earth orbit, the Administrator may permit short-duration missions to the ISS for commercial passengers.

(e) PROGRAM AUTHORIZATION.—

(1) ESTABLISHMENT.—The Administrator shall establish a low-Earth orbit commercialization program to encourage the fullest commercial use and development of space by private entities in the United States.

(2) ELEMENTS.—The program established under paragraph (1) shall, to the maximum extent practicable, include activities—

(A) to stimulate demand for—

(i) space-based commercial research, development, and manufacturing;

(ii) spaceflight products and services; and

(iii) human spaceflight products and services in low-Earth orbit;

(B) to improve the capability of the ISS to accommodate commercial users; and

(C) subject to paragraph (3), to foster the development of commercial space stations and habitats.

(3) COMMERCIAL SPACE STATIONS AND HABITATS.—

(A) PRIORITY.—With respect to an activity to develop a commercial space station or habitat, the Administrator shall give priority to an activity for which a private entity provides a share of the cost to develop and operate the activity.

(B) LIMITATION.—The Administrator may not provide funding for the development of a commercial space station or habitat until after the date on which the Administrator awards a contract for the use of a docking port on the ISS.

(C) REPORT.—Not later than 30 days after the date that an award or agreement is made to carry out an activity to develop a commercial space station or habitat, the Administrator shall submit to the appropriate committees of Congress a report on the development of the commercial space station or habitat, as applicable, that includes—

(i) a business plan that describes the manner in which the project will—

(I) meet the future requirements of NASA for low-Earth orbit human space-flight services; and

(II) fulfill the cost-share funding prioritization under subparagraph (A); and

(ii) a review of the viability of the operational business case, including—

(I) the level of expected Government participation;

(II) a list of anticipated non-governmental an international customers and associated contributions; and

(III) an assessment of long-term sustainability for the nongovernmental customers, including an independent assessment of the viability of the market for such commercial services or products.

SEC. 212. MAINTAINING A NATIONAL LABORATORY IN SPACE.

(a) SENSE OF CONGRESS.—It is the sense of Congress that—

(1) the United States segment of the International Space Station (as defined in section 70905 of title 51, United States Code), which is designated as a national laboratory under section 70905(b) of title 51, United States Code—

(A) benefits the scientific community and promotes commerce in space;

(B) fosters stronger relationships among NASA and other Federal agencies, the private sector, and research groups and universities;

(C) advances science, technology, engineering, and mathematics education through use of the unique microgravity environment; and

(D) advances human knowledge and international cooperation;

(2) after the ISS is decommissioned, the United States should maintain a national microgravity laboratory in space;

(3) in maintaining a national microgravity laboratory in space, the United States should make appropriate accommodations for different types of ownership and operation arrangements for the ISS and future space stations;

(4) to the maximum extent practicable, a national microgravity laboratory in space should be

maintained in cooperation with international space partners; and

(5) NASA should continue to support fundamental science research on future platforms in low-Earth orbit and cislunar space, orbital and suborbital flights, drop towers, and other microgravity testing environments.

(b) REPORT.—The Administrator, in coordination with the National Space Council and other Federal agencies as the Administrator considers appropriate, shall issue a report detailing the feasibility of establishing a microgravity national laboratory federally funded research and development center to carry out activities relating to the study and use of in-space conditions.

SEC. 213. INTERNATIONAL SPACE STATION NATIONAL LABORATORY; PROPERTY RIGHTS IN INVENTIONS.

(a) IN GENERAL.—Subchapter III of chapter 201 of title 51, United States Code, is amended by adding at the end the following:

"§ 20150. Property rights in designated inventions

"(a) EXCLUSIVE PROPERTY RIGHTS.—Notwithstanding section 3710a of title 15, chapter 18 of title 35, section 20135, or any other provision of law, a designated

invention shall be the exclusive property of a user, and shall not be subject to a Government-purpose license, if—

"(1) the Administration is reimbursed under the terms of the contract for the full cost of a contribution by the Federal Government of the use of Federal facilities, equipment, materials, proprietary information of the Federal Government, or services of a Federal employee during working hours, including the cost for the Administration to carry out its responsibilities under paragraphs (1) and (4) of section 504(d) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18354(d));

"(2) Federal funds are not transferred to the user under the contract; and

"(3) the invention was made (as defined in section 20135(a))—

"(A) solely by the user; or

"(B)(i) by the user with the services of a Federal employee under the terms of the contract; and

"(ii) the Administration is reimbursed for such services under paragraph (1).

"(b) RULE OF CONSTRUCTION.—Nothing in this section may be construed to affect the rights of the Federal

Government, including property rights in inventions, under any contract, except in the case of a written contract with the Administration or the ISS management entity for the performance of a designated activity.

"(c) DEFINITIONS.—In this section—

"(1) CONTRACT.—The term 'contract' has the meaning giving the term in section 20135(a).

"(2) DESIGNATED ACTIVITY.—The term 'designated activity' means any non-NASA scientific use of the ISS national laboratory as described in section 504 of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18354).

"(3) DESIGNATED INVENTION.—The term 'designated invention' means any invention conceived or first reduced to practice by any person in the performance of a designated activity under a written contract with the Administration or the ISS management entity.

"(4) GOVERNMENT-PURPOSE LICENSE.—The term 'Government-purpose license' means the reservation by the Federal Government of an irrevocable, nonexclusive, nontransferable, royalty-free license for the use of an invention throughout the world by or on behalf of the United States or any foreign government

pursuant to a treaty or agreement with the United States.

"(5) ISS MANAGEMENT ENTITY.—The term 'ISS management entity' means the organization with which the Administrator enters into a cooperative agreement under section 504(a) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18354(a)).

"(6) USER.—The term 'user' means a person, including a nonprofit organization or small business firm (as such terms are defined in section 201 of title 35), or class of persons that enters into a written contract with the Administration or the ISS management entity for the performance of designated activities.".

(b) CONFORMING AMENDMENT.—The table of sections for chapter 201 of title 51, United States Code, is amended by inserting after the item relating to section 20149 the following:

"20150. Property rights in designated inventions.".

SEC. 214. DATA FIRST PRODUCED DURING NON-NASA SCIENTIFIC USE OF THE ISS NATIONAL LABORATORY.

(a) DATA RIGHTS.—Subchapter III of chapter 201 of title 51, United States Code, as amended by section 213, is further amended by adding at the end the following:

"§ 20151. Data rights

"(a) NON-NASA SCIENTIFIC USE OF THE ISS NATIONAL LABORATORY.—The Federal Government may not use or reproduce, or disclose outside of the Government, any data first produced in the performance of a designated activity under a written contract with the Administration or the ISS management entity, unless—

"(1) otherwise agreed under the terms of the contract with the Administration or the ISS management entity, as applicable;

"(2) the designated activity is carried out with Federal funds;

"(3) disclosure is required by law;

"(4) the Federal Government has rights in the data under another Federal contract, grant, cooperative agreement, or other transaction; or

"(5) the data is—

"(A) otherwise lawfully acquired or independently developed by the Federal Government;

"(B) related to the health and safety of personnel on the ISS; or

"(C) essential to the performance of work by the ISS management entity or NASA personnel.

"(b) DEFINITIONS.—In this section:

"(1) CONTRACT.—The term 'contract' has the meaning given the term under section 20135(a).

"(2) DATA.—

"(A) IN GENERAL.—The term 'data' means recorded information, regardless of form or the media on which it may be recorded.

"(B) INCLUSIONS.—The term 'data' includes technical data and computer software.

"(C) EXCLUSIONS.—The term 'data' does not include information incidental to contract administration, such as financial, administrative, cost or pricing, or management information.

"(3) DESIGNATED ACTIVITY.—The term 'designated activity' has the meaning given the term in section 20150.

"(4) ISS MANAGEMENT ENTITY.—The term 'ISS management entity' has the meaning given the term in section 20150.".

(b) SPECIAL HANDLING OF TRADE SECRETS OR CONFIDENTIAL INFORMATION.—Section 20131(b)(2) of title 51, United States Code, is amended to read as follows:

"(2) INFORMATION DESCRIBED.—

"(A) ACTIVITIES UNDER AGREEMENT.—Information referred to in paragraph (1) is information that—

"(i) results from activities conducted under an agreement entered into under subsections (e) and (f) of section 20113; and

"(ii) would be a trade secret or commercial or financial information that is privileged or confidential within the meaning of section 552(b)(4) of title 5 if the information had been obtained from a non-Federal party participating in such an agreement.

"(B) CERTAIN DATA.—Information referred to in paragraph (1) includes data (as defined in section 20151) that—

"(i) was first produced by the Administration in the performance of any designated activity (as defined in section 20150); and

"(ii) would be a trade secret or commercial or financial information that is privileged or confidential within the meaning of section 552(b)(4) of title 5 if the data had been obtained from a non-Federal party.".

(c) CONFORMING AMENDMENT.—The table of sections for chapter 201 of title 51, United States Code, as amended

by section 213, is further amended by inserting after the item relating to section 20150 the following:

"20151. Data rights.".

SEC. 215. ROYALTIES AND OTHER PAYMENTS RECEIVED FOR DESIGNATED ACTIVITIES.

(a) SENSE OF CONGRESS.—It is the sense of Congress that the Administrator should determine a threshold for which it may be appropriate for NASA to recoup the costs of supporting the creation of invention aboard the ISS, through the negotiation of royalties, similar to agreements made by other Federal agencies that support private sector innovation.

(b) IN GENERAL.—Subchapter III of chapter 201 of title 51, United States Code, as amended by sections 213 and 214, is further amended by adding at the end the following:

"§ 20152. Royalties and other payments received for designated activities

"(a) DESIGNATED INVENTIONS MADE WITH FEDERAL ASSISTANCE.—Notwithstanding any other provision of law, if the Administration, under the terms of a written contract for the performance of a designated activity, agrees to provide, unreimbursed, the total cost of a contribution by the Federal Government of the use of Federal facilities, equipment, materials, proprietary information of the Federal Government, or services of a Federal employee during work-

ing hours, including the cost for the Administration to carry out its responsibilities under paragraphs (1) and (4) of section 504(d) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18354(d)), the Administrator shall negotiate an agreement on the terms and rates of royalty payments with respect to an invention or class of inventions conceived or first reduced to practice by any person or class of persons in the performance of such designated activities.

"(b) LICENSING AND ASSIGNMENT OF INVENTIONS.—Notwithstanding sections 3710a and 3710c of title 15 and any other provision of law, after payment in accordance with subsection (A)(i) of such section 3710c(a)(1)(A)(i) to the inventors who have directly assigned to the Federal Government their interests in an invention under a written contract with the Administration or the ISS management entity for the performance of a designated activity, the balance of any royalty or other payment received by the Administrator or the ISS management entity from licensing and assignment of such invention shall be paid by the Administrator or the ISS management entity, as applicable, to the Space Exploration Fund.

"(c) SPACE EXPLORATION FUND.—

"(1) ESTABLISHMENT.—There is established in the Treasury of the United States a fund, to be known

as the 'Space Exploration Fund' (referred to in this subsection as the 'Fund'), to be administered by the Administrator.

"(2) USE OF FUND.—The Fund shall be available without fiscal year limitation and without further appropriation to carry out space exploration activities under section 20302.

"(3) DEPOSITS.—There shall be deposited in the Fund—

"(A) amounts appropriated to the Fund;

"(B) fees and royalties collected by the Administrator or the ISS management entity under subsections (a) and (b); and

"(C) donations or contributions designated to support authorized activities.

"(4) RULE OF CONSTRUCTION.—Amounts available to the Administrator under this subsection shall be in addition to amounts otherwise made available for the purpose described in paragraph (2).

"(d) DEFINITIONS.—The terms used in this section have the meanings given the terms in section 20150.".

(c) CONFORMING AMENDMENT.—The table of sections for chapter 201 of title 51, United States Code, as amended by sections 213 and 214, is further amended by inserting after the item relating to section 20151 the following:

"20152. Royalties and other payments received for designated activities.".

SEC. 216. STEPPINGSTONE APPROACH TO EXPLORATION.

(a) IN GENERAL.—Section 70504 of title 51, United States Code, is amended to read as follows:

"§ 70504. Steppingstone approach to exploration

"(a) IN GENERAL.—The Administrator, in sustainable steps, may conduct missions to intermediate destinations, such as the Moon, in accordance with section 20302(b), and on a timetable determined by the availability of funding, in order to achieve the objective of human exploration of Mars specified in section 202(b)(5) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18312(b)(5)), if the Administrator—

"(1) determines that each such mission demonstrates or advances a technology or operational concept that will enable human missions to Mars; and

"(2) incorporates each such mission into the human exploration roadmap under section 432 of the National Aeronautics and Space Administration Transition Authorization Act of 2017 (Public Law 115–10; 51 U.S.C. 20302 note).

"(b) CISLUNAR SPACE EXPLORATION ACTIVITIES.—In conducting a mission under subsection (a), the Administrator shall—

"(1) use a combination of launches of the Space Launch System and space transportation services

from United States commercial providers, as appropriate, for the mission;

"(2) plan for not fewer than 1 Space Launch System launch annually beginning after the first successful crewed launch of Orion on the Space Launch System; and

"(3) establish an outpost in orbit around the Moon that—

"(A) demonstrates technologies, systems, and operational concepts directly applicable to the space vehicle that will be used to transport humans to Mars;

"(B) has the capability for periodic human habitation; and

"(C) can function as a point of departure, return, or staging for Administration or nongovernmental or international partner missions to multiple locations on the lunar surface or other destinations.

"(c) COST-EFFECTIVENESS.—To maximize the cost-effectiveness of the long-term space exploration and utilization activities of the United States, the Administrator shall take all necessary steps, including engaging nongovernmental and international partners, to ensure that activities in the Administration's human space exploration program

are balanced in order to help meet the requirements of future exploration and utilization activities leading to human habitation on the surface of Mars.

"(d) COMPLETION.—Within budgetary considerations, once an exploration-related project enters its development phase, the Administrator shall seek, to the maximum extent practicable, to complete that project without undue delay.

"(e) INTERNATIONAL PARTICIPATION.—To achieve the goal of successfully conducting a crewed mission to the surface of Mars, the Administrator shall invite the partners in the ISS program and other nations, as appropriate, to participate in an international initiative under the leadership of the United States.".

(b) DEFINITION OF CISLUNAR SPACE.—Section 10101 of title 51, United States Code, is amended by adding at the end the following:

"(3) CISLUNAR SPACE.—The term 'cislunar space' means the region of space beyond low-Earth orbit out to and including the region around the surface of the Moon.".

(c) TECHNICAL AND CONFORMING AMENDMENTS.—Section 3 of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18302) is amended by striking paragraphs (2) and (3) and inserting the following:

"(2) APPROPRIATE COMMITTEES OF CONGRESS.—The term 'appropriate committees of Congress' means—

"(A) the Committee on Commerce, Science, and Transportation of the Senate; and

"(B) the Committee on Science, Space, and Technology of the House of Representatives.

"(3) CISLUNAR SPACE.—The term 'cislunar space' means the region of space beyond low-Earth orbit out to and including the region around the surface of the Moon.".

SEC. 217. TECHNICAL AMENDMENTS RELATING TO ARTEMIS MISSIONS.

(a) Section 421 of the National Aeronautics and Space Administration Authorization Act of 2017 (Public Law 115–10; 51 U.S.C. 20301 note) is amended—

(1) in subsection (c)(3)—

(A) by striking "EM–1" and inserting "Artemis 1";

(B) by striking "EM–2" and inserting "Artemis 2"; and

(C) by striking "EM–3" and inserting "Artemis 3"; and

(2) in subsection (f)(3), by striking "EM–3" and inserting "Artemis 3".

(b) Section 432(b) of the National Aeronautics and Space Administration Authorization Act of 2017 (Public Law 115–10; 51 U.S.C. 20302 note) is amended—

(1) in paragraph (3)(D)—

(A) by striking "EM–1" and inserting "Artemis 1"; and

(B) by striking "EM–2" and inserting "Artemis 2"; and

(2) in paragraph (4)(C), by striking "EM–3" and inserting "Artemis 3".

TITLE III—SCIENCE

SEC. 301. SCIENCE PRIORITIES.

(a) SENSE OF CONGRESS ON SCIENCE PORTFOLIO.—Congress reaffirms the sense of Congress that—

(1) a balanced and adequately funded set of activities, consisting of research and analysis grant programs, technology development, suborbital research activities, and small, medium, and large space missions, contributes to a robust and productive science program and serves as a catalyst for innovation and discovery; and

(2) the Administrator should set science priorities by following the guidance provided by the scientific community through the decadal surveys of the

National Academies of Sciences, Engineering, and Medicine.

(b) NATIONAL ACADEMIES DECADAL SURVEYS.—Section 20305(c) of title 51, United States Code, is amended—

(1) by striking "The Administrator shall" and inserting the following:

"(1) REEXAMINATION OF PRIORITIES BY NATIONAL ACADEMIES.—The Administrator shall"; and

(2) by adding at the end the following:

"(2) REEXAMINATION OF PRIORITIES BY ADMINISTRATOR.—If the Administrator decides to reexamine the applicability of the priorities of the decadal surveys to the missions and activities of the Administration due to scientific discoveries or external factors, the Administrator shall consult with the relevant committees of the National Academies.".

SEC. 302. LUNAR DISCOVERY PROGRAM.

(a) IN GENERAL.—The Administrator may carry out a program to conduct lunar science research, including missions to the surface of the Moon, that materially contributes to the objective described in section 20102(d)(1) of title 51, United States Code.

(b) COMMERCIAL LANDERS.—In carrying out a program under subsection (a), the Administrator shall procure the services of commercial landers developed primarily by

United States industry to land science payloads of all classes on the lunar surface.

(c) LUNAR SCIENCE RESEARCH.—The Administrator shall ensure that lunar science research carried out under subsection (a) is consistent with recommendations made by the National Academies of Sciences, Engineering, and Medicine.

(d) LUNAR POLAR VOLATILES.—In carrying out a program under subsection (a), the Administrator shall, at the earliest opportunity, consider mission proposals to evaluate the potential of lunar polar volatiles to contribute to sustainable lunar exploration.

SEC. 303. SEARCH FOR LIFE.

(a) SENSE OF CONGRESS.—It is the sense of Congress that—

(1) the report entitled "An Astrobiology Strategy for the Search for Life in the Universe" published by the National Academies of Sciences, Engineering, and Medicine outlines the key scientific questions and methods for fulfilling the objective of NASA to search for the origin, evolution, distribution, and future of life in the universe; and

(2) the interaction of lifeforms with their environment, a central focus of astrobiology research, is a

topic of broad significance to life sciences research in space and on Earth.

(b) PROGRAM CONTINUATION.—

(1) IN GENERAL.—The Administrator shall continue to implement a collaborative, multidisciplinary science and technology development program to search for proof of the existence or historical existence of life beyond Earth in support of the objective described in section 20102(d)(10) of title 51, United States Code.

(2) ELEMENT.—The program under paragraph (1) shall include activities relating to astronomy, biology, geology, and planetary science.

(3) COORDINATION WITH LIFE SCIENCES PROGRAM.—In carrying out the program under paragraph (1), the Administrator shall coordinate efforts with the life sciences program of the Administration.

(4) TECHNOSIGNATURES.—In carrying out the program under paragraph (1), the Administrator shall support activities to search for and analyze technosignatures.

(5) INSTRUMENTATION AND SENSOR TECHNOLOGY.—In carrying out the program under paragraph (1), the Administrator may strategically invest in the development of new instrumentation and sensor technology.

SEC. 304. JAMES WEBB SPACE TELESCOPE.

(a) SENSE OF CONGRESS.—It is the sense of Congress that—

(1) the James Webb Space Telescope will be the next premier observatory in space and has great potential to further scientific study and assist scientists in making new discoveries in the field of astronomy;

(2) the James Webb Space Telescope was developed as an ambitious project with a scope that was not fully defined at inception and with risk that was not fully known or understood;

(3) despite the major technology development and innovation that was needed to construct the James Webb Space Telescope, major negative impacts to the cost and schedule of the James Webb Space Telescope resulted from poor program management and poor contractor performance;

(4) the Administrator should take into account the lessons learned from the cost and schedule issues relating to the development of the James Webb Space Telescope in making decisions regarding the scope of and the technologies needed for future scientific missions;

(5) in selecting future scientific missions, the Administrator should take into account the impact that large programs that overrun cost and schedule esti-

mates may have on other NASA programs in earlier phases of development; and

(6) the Administrator should continue to develop the James Webb Space Telescope with a development cost of not more than $8,802,700,000, as estimated by the James Webb Space Telescope Independent Review Board Report released in May 2018.

(b) PROJECT CONTINUATION.—

(1) IN GENERAL.—The Administrator shall continue—

(A) to closely track the cost and schedule performance of the James Webb Space Telescope project; and

(B) to improve the reliability of cost estimates and contractor performance data throughout the remaining development of the James Webb Space Telescope.

(2) KEY PROGRAM OBJECTIVE.—The Administrator shall continue to develop the James Webb Space Telescope on a schedule to meet the objective of safely launching the James Webb Space Telescope not later than March 31, 2021.

SEC. 305. WIDE-FIELD INFRARED SURVEY TELESCOPE.

(a) SENSE OF CONGRESS.—It is the sense of Congress that—

(1) major growth in the cost of astrophysics flagship-class missions has impacted the overall portfolio balance of the Science Mission Directorate; and

(2) the Administrator should continue to develop the Wide-Field Infrared Survey Telescope with a development cost of not more than $3,200,000,000.

(b) PROJECT CONTINUATION.—The Administrator shall continue to develop the Wide-Field Infrared Survey Telescope to meet the objectives outlined in the 2010 decadal survey on astronomy and astrophysics of the National Academies of Sciences, Engineering, and Medicine in a manner that maximizes scientific productivity based on the resources invested.

SEC. 306. SATELLITE SERVICING FOR SCIENCE MISSIONS.

(a) STUDY.—

(1) IN GENERAL.—The Administrator shall conduct a study on the feasibility of using in-space robotic refueling, repair, or refurbishment capabilities to extend the useful life of telescopes and other science missions that are operational or in development as of the date of the enactment of this Act.

(2) ELEMENTS.—The study conducted under paragraph (1) shall include the following:

(A) An identification of the technologies and in-space testing required to demonstrate the in-

space robotic refueling, repair, or refurbishment capabilities described in paragraph (1).

(B) The projected cost of using such capabilities, including the cost of extended operations for science missions described in that paragraph.

(b) BRIEFING.—Not later than 1 year after the date of the enactment of this Act, the Administrator shall provide to the appropriate committees of Congress and the Space Studies Board of the National Academies of Sciences, Engineering, and Medicine a briefing on the results of the study conducted under subsection (a)(1).

SEC. 307. EARTH SCIENCE MISSIONS AND PROGRAMS.

(a) SENSE OF CONGRESS.—It is the sense of Congress that the Earth Science Division of NASA plays an important role in national efforts—

(1) to collect and use Earth observations in service to society; and

(2) to understand global change.

(b) EARTH SCIENCE MISSIONS AND PROGRAMS.—With respect to the missions and programs of the Earth Science Division, the Administrator shall, to the maximum extent practicable, follow the recommendations and guidance provided by the scientific community through the decadal survey for Earth science and applications from space of the

National Academies of Sciences, Engineering, and Medicine, including—

(1) the science priorities described in such survey;

(2) the execution of the series of existing or previously planned observations (commonly known as the "program of record"); and

(3) the development of a range of missions of all classes, including opportunities for principal investigator-led, competitively selected missions.

SEC. 308. SCIENCE MISSIONS TO MARS.

(a) IN GENERAL.—The Administrator shall conduct 1 or more science missions to Mars to enable the selection of 1 or more sites for human landing.

(b) SAMPLE PROGRAM.—The Administrator may carry out a program—

(1) to collect samples from the surface of Mars; and

(2) to return such samples to Earth for scientific analysis.

(c) USE OF EXISTING CAPABILITIES AND ASSETS.—In carrying out this section, the Administrator shall, to the maximum extent practicable, use existing capabilities and assets of NASA centers.

SEC. 309. PLANETARY DEFENSE COORDINATION OFFICE.

(a) FINDINGS.—Congress makes the following findings:

(1) Near-Earth objects remain a threat to the United States.

(2) Section 321(d)(1) of the National Aeronautics and Space Administration Authorization Act of 2005 (Public Law 109–155; 119 Stat. 2922; 51 U.S.C. 71101 note prec.) established a requirement that the Administrator plan, develop, and implement a Near-Earth Object Survey program to detect, track, catalogue, and characterize the physical characteristics of near-Earth objects equal to or greater than 140 meters in diameter in order to assess the threat of such near-Earth objects to the Earth, with the goal of 90-percent completion of the catalogue of such near-Earth objects by December 30, 2020.

(3) The current planetary defense strategy of NASA acknowledges that such goal will not be met.

(4) The report of the National Academies of Sciences, Engineering, and Medicine entitled "Finding Hazardous Asteroids Using Infrared and Visible Wavelength Telescopes" issued in 2019 states that—

(A) NASA cannot accomplish such goal with currently available assets;

(B) NASA should develop and launch a dedicated space-based infrared survey telescope to

meet the requirements of section 321(d)(1) of the National Aeronautics and Space Administration Authorization Act of 2005 (Public Law 109–155; 119 Stat. 2922; 51 U.S.C. 71101 note prec.); and

(C) the early detection of potentially hazardous near-Earth objects enabled by a space-based infrared survey telescope is important to enable deflection of a dangerous asteroid.

(5) A comprehensive survey of near-Earth objects is vital to—

(A) the national security of the United States; and

(B) the safety and security of the assets and personnel of the United States Armed Forces throughout the world.

(b) ESTABLISHMENT OF PLANETARY DEFENSE COORDINATION OFFICE.—

(1) IN GENERAL.—Not later than 90 days after the date of the enactment of this Act, the Administrator shall establish an office within the Planetary Science Division of the Science Mission Directorate, to be known as the "Planetary Defense Coordination Office", to plan, develop, and implement a program to survey threats posed by near-Earth objects equal to or greater than 140 meters in diameter, as required

by section 321(d)(1) of the National Aeronautics and Space Administration Authorization Act of 2005 (Public Law 109–155; 119 Stat. 2922; 51 U.S.C. 71101 note prec.).

(2) ACTIVITIES.—The Administrator shall—

(A) develop and, not later than September 30, 2025, launch a space-based infrared survey telescope that is capable of detecting near-Earth objects equal to or greater than 140 meters in diameter, with preference given to planetary missions selected by the Administrator as of the date of the enactment of this Act to pursue concept design studies relating to the development of a space-based infrared survey telescope;

(B) identify, track, and characterize potentially hazardous near-Earth objects and issue warnings of the effects of potential impacts of such objects; and

(C) assist in coordinating Government planning for response to a potential impact of a near-Earth object.

(3) DEPARTMENT OF DEFENSE SUPPORT.—The Secretary of Defense shall, as appropriate, support efforts of the Administrator in carrying out this section.

(c) ANNUAL REPORT.—Section 321(f) of the National Aeronautics and Space Administration Authorization Act of 2005 (Public Law 109–155; 119 Stat. 2922; 51 U.S.C. 71101 note prec.) is amended to read as follows:

"(f) ANNUAL REPORT.—Not later than September 30, 2020, and annually thereafter through 90-percent completion of the catalogue required by subsection (d)(1), the Administrator shall submit to the Committee on Commerce, Science, and Transportation of the Senate and the Committee on Science, Space, and Technology of the House of Representatives a report that includes the following:

"(1) A summary of all activities carried out by the Planetary Defense Coordination Office established under section 309(b)(1) of the National Aeronautics and Space Administration Authorization Act of 2019 since the date of enactment of that Act.

"(2) A description of the progress with respect to the design, development, and launch of the space-based infrared survey telescope required by section 309(b)(2)(A) of the National Aeronautics and Space Administration Authorization Act of 2019.

"(3) An assessment of the progress toward meeting the requirements of subsection (d)(1).

"(4) A description of the status of efforts to coordinate planetary defense activities in response to a

threat posed by a near-Earth object with other Federal agencies since the date of enactment of the National Aeronautics and Space Administration Authorization Act of 2019.

"(5) A description of the status of efforts to coordinate and cooperate with other countries to discover hazardous asteroids and comets, plan a mitigation strategy, and implement that strategy in the event of the discovery of an object on a likely collision course with Earth.

"(6) A summary of expenditures for all activities carried out by the Planetary Defense Coordination Office since the date of enactment of the National Aeronautics and Space Administration Authorization Act of 2019.".

(d) LIMITATION ON USE OF FUNDS.—Of the amounts authorized to be appropriated by this Act, not more than 80 percent of amounts authorized to be appropriated for the Office of the Administrator for a fiscal year may be obligated or expended until the date on which the Administrator submits the report for such fiscal year required by section 321(f) of the National Aeronautics and Space Administration Authorization Act of 2005 (Public Law 109–155; 119 Stat. 2922; 51 U.S.C. 71101 note prec.).

(e) NEAR-EARTH OBJECT DEFINED.—In this section, the term "near-Earth object" means an asteroid or comet with a perihelion distance of less than 1.3 Astronomical Units from the Sun.

SEC. 310. SUBORBITAL SCIENCE FLIGHTS.

(a) SENSE OF CONGRESS.—It is the sense of Congress that commercially available suborbital flight platforms enable low-cost access to a microgravity environment to advance science and train scientists and engineers under the Suborbital Research Program established under section 802(c) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18382(c)).

(b) REPORT.—

(1) IN GENERAL.—Not later than 270 days after the date of the enactment of this Act, the Administrator shall submit to the appropriate committees of Congress a report evaluating the manner in which suborbital flight platforms can contribute to meeting the science objectives of NASA for the Science Mission Directorate and the Human Exploration and Operations Mission Directorate.

(2) CONTENTS.—The report required by paragraph (1) shall include the following:

(A) An assessment of the advantages of suborbital flight platforms to meet science objectives.

(B) An evaluation of the challenges to greater use of commercial suborbital flight platforms for science purposes.

(C) An analysis of whether commercial suborbital flight platforms can provide low-cost flight opportunities to test lunar and Mars science payloads.

SEC. 311. EARTH SCIENCE DATA AND OBSERVATIONS.

(a) IN GENERAL.—The Administrator shall make available to the public in an easily accessible electronic database all data (including metadata, documentation, models, data processing methods, images, synchronization frames, communications headers, duplicate data, and research results) of the missions and programs of the Earth Science Division of the Administration, or any successor division.

(b) OPEN DATA PROGRAM.—In carrying out subsection (a), the Administrator shall establish and continue to operate an open data program that—

(1) is consistent with the greatest degree of interactivity, interoperability, and accessibility; and

(2) enables outside communities, including the research and applications community, private industry, academia, and the general public, to effectively collaborate in areas important to—

(A) studying the Earth system and improving the prediction of Earth system change; and

(B) improving model development, data assimilation techniques, systems architecture integration, and computational efficiencies; and

(3) meets basic end-user requirements for running on public computers and networks located outside of secure Administration information and technology systems.

(c) HOSTING.—The program under subsection (b) shall use, as appropriate and cost-effective, innovative strategies and methods for hosting and management of part or all of the program, including cloud-based computing capabilities.

SEC. 312. SENSE OF CONGRESS ON SMALL SATELLITE SCIENCE.

It is the sense of Congress that—

(1) small satellites—

(A) are increasingly robust, effective, and affordable platforms for carrying out space science missions;

(B) can work in tandem with or augment larger NASA spacecraft to support high-priority science missions of NASA; and

(C) are cost effective solutions that may allow NASA to continue collecting legacy observations while developing next-generation science missions; and

(2) NASA should continue to support small satellite research, development, technologies, and programs, including technologies for compact and lightweight instrumentation for small satellites.

SEC. 313. SENSE OF CONGRESS ON COMMERCIAL SPACE SERVICES.

It is the sense of Congress that—

(1) the Administration should explore partnerships with the commercial space industry for space science missions in and beyond Earth orbit, including partnerships relating to payload and instrument hosting and commercially available datasets; and

(2) such partnerships could result in increased mission cadence, technology advancement, and cost savings for the Administration.

SEC. 314. PROCEDURES FOR IDENTIFYING AND ADDRESSING ALLEGED VIOLATIONS OF SCIENTIFIC INTEGRITY POLICY.

Not later than October 1, 2020, the Administrator shall develop and document procedures for identifying and ad-

dressing alleged violations of the scientific integrity policy of NASA.

TITLE IV—AERONAUTICS

SEC. 401. SHORT TITLE.

This title may be cited as the "Aeronautics Innovation Act".

SEC. 402. DEFINITIONS.

In this title:

(1) AERONAUTICS STRATEGIC IMPLEMENTATION PLAN.—The term "Aeronautics Strategic Implementation Plan" means the Aeronautics Strategic Implementation Plan issued by the Aeronautics Research Mission Directorate.

(2) UNMANNED AIRCRAFT; UNMANNED AIRCRAFT SYSTEM.—The terms "unmanned aircraft" and "unmanned aircraft system" have the meanings given those terms in section 44801 of title 49, United States Code.

(3) X-PLANE.—The term "X-plane" means an experimental aircraft that is—

(A) used to test and evaluate a new technology or aerodynamic concept; and

(B) operated by NASA or the Department of Defense.

SEC. 403. EXPERIMENTAL AIRCRAFT PROJECTS.

(a) SENSE OF CONGRESS.—It is the sense of Congress that—

(1) developing high-risk, precompetitive aerospace technologies for which there is not yet a profit rationale is a fundamental role of NASA;

(2) large-scale piloted flight test experimentation and validation are necessary for—

(A) transitioning new technologies and materials, including associated manufacturing processes, for general aviation, commercial aviation, and military aeronautics use; and

(B) capturing the full extent of benefits from investments made by the Aeronautics Research Mission Directorate in priority programs called for in—

(i) the National Aeronautics Research and Development Plan issued by the National Science and Technology Council in February 2010;

(ii) the NASA 2014 Strategic Plan;

(iii) the Aeronautics Strategic Implementation Plan; and

(iv) any updates to the programs called for in the plans described in clauses (i) through (iii);

(3) a level of funding that adequately supports large-scale piloted flight test experimentation and validation, including related infrastructure, should be ensured over a sustained period of time to restore the capacity of NASA—

(A) to see legacy priority programs through to completion; and

(B) to achieve national economic and security objectives; and

(4) NASA should not be directly involved in the Type Certification of aircraft for current and future scheduled commercial air service under part 121 or 135 of title 14, Code of Federal Regulations, that would result in reductions in crew augmentation or single pilot or autonomously operated aircraft.

(b) STATEMENT OF POLICY.—It is the policy of the United States—

(1) to maintain world leadership in—

(A) military and civilian aeronautical science and technology;

(B) global air power projection; and

(C) industrialization; and

(2) to maintain as a fundamental objective of NASA aeronautics research the steady progression and expansion of flight research and capabilities, in-

cluding the science and technology of critical underlying disciplines and competencies, such as—

(A) computational-based analytical and predictive tools and methodologies;

(B) aerothermodynamics;

(C) propulsion;

(D) advanced materials and manufacturing processes;

(E) high-temperature structures and materials; and

(F) guidance, navigation, and flight controls.

(c) ESTABLISHMENT AND CONTINUATION OF X-PLANE PROJECTS.—

(1) IN GENERAL.—The Administrator shall establish or continue to implement, in a manner that is consistent with the roadmap for supersonic aeronautics research and development required by section 604(b) of the National Aeronautics and Space Administration Transition Authorization Act of 2017 (Public Law 115–10; 131 Stat. 55), the following projects:

(A) A low-boom supersonic aircraft project to demonstrate supersonic aircraft designs and technologies that—

(i) reduce sonic boom noise; and

(ii) assist the Administrator of the Federal Aviation Administration in enabling—

(I) the safe commercial deployment of civil supersonic aircraft technology; and

(II) the safe and efficient operation of civil supersonic aircraft.

(B) A subsonic flight demonstrator aircraft project to advance aircraft designs and technologies that enable significant increases in energy efficiency and reduced life-cycle emissions in the aviation system while reducing noise and emissions.

(C) A series of large-scale X-plane demonstrators that are—

(i) developed sequentially or in parallel; and

(ii) each based on a set of new configuration concepts or technologies determined by the Administrator to demonstrate—

(I) aircraft and propulsion concepts and technologies and related advances in alternative propulsion and energy; and

(II) flight propulsion concepts and technologies.

(2) ELEMENTS.—For each project under paragraph (1), the Administrator shall—

(A) include the development of X-planes and all necessary supporting flight test assets;

(B) pursue a robust technology maturation and flight test validation effort;

(C) improve necessary facilities, flight testing capabilities, and computational tools to support the project;

(D) award any primary contracts for design, procurement, and manufacturing to United States persons, consistent with international obligations and commitments;

(E) coordinate research and flight test demonstration activities with other Federal agencies and the United States aviation community, as the Administrator considers appropriate; and

(F) ensure that the project is aligned with the Aeronautics Strategic Implementation Plan and any updates to the Aeronautics Strategic Implementation Plan.

(3) UNITED STATES PERSON DEFINED.—In this subsection, the term "United States person" means—

(A) a United States citizen or an alien lawfully admitted for permanent residence to the United States; or

(B) an entity organized under the laws of the United States or of any jurisdiction within the United States, including a foreign branch of such an entity.

(d) ADVANCED MATERIALS AND MANUFACTURING TECHNOLOGY PROGRAM.—

(1) IN GENERAL.—The Administrator may establish an advanced materials and manufacturing technology program—

(A) to develop—

(i) new materials, including composite and high-temperature materials, from base material formulation through full-scale structural validation and manufacture;

(ii) advanced materials and manufacturing processes, including additive manufacturing, to reduce the cost of manufacturing scale-up and certification for use in general aviation, commercial aviation, and military aeronautics; and

(iii) noninvasive or nondestructive techniques for testing or evaluating aviation

and aeronautics structures, including for materials and manufacturing processes;

(B) to reduce the time it takes to design, industrialize, and certify advanced materials and manufacturing processes;

(C) to provide education and training opportunities for the aerospace workforce; and

(D) to address global cost and human capital competitiveness for United States aeronautical industries and technological leadership in advanced materials and manufacturing technology.

(2) ELEMENTS.—In carrying out a program under paragraph (1), the Administrator shall—

(A) build on work that was carried out by the Advanced Composites Project of NASA;

(B) partner with the private and academic sectors, such as members of the Advanced Composites Consortium of NASA, the Joint Advanced Materials and Structures Center of Excellence of the Federal Aviation Administration, the Manufacturing USA institutes of the Department of Commerce, and national laboratories, as the Administrator considers appropriate;

(C) provide a structure for managing intellectual property generated by the program based on or consistent with the structure established for the Advanced Composites Consortium of NASA;

(D) ensure adequate Federal cost share for applicable research; and

(E) coordinate with advanced manufacturing and composites initiatives in other mission directorates of NASA, as the Administrator considers appropriate.

(e) RESEARCH PARTNERSHIPS.—In carrying out the projects under subsection (c) and a program under subsection (d), the Administrator may engage in cooperative research programs with—

(1) academia; and

(2) commercial aviation and aerospace manufacturers.

SEC. 404. UNMANNED AIRCRAFT SYSTEMS.

(a) UNMANNED AIRCRAFT SYSTEMS OPERATION PROGRAM.—The Administrator shall—

(1) research and test capabilities and concepts, including unmanned aircraft systems communications, for integrating unmanned aircraft systems into the national airspace system;

(2) leverage the partnership NASA has with industry focused on the advancement of technologies for future air traffic management systems for unmanned aircraft systems; and

(3) continue to align the research and testing portfolio of NASA to inform the integration of unmanned aircraft systems into the national airspace system, consistent with public safety and national security objectives.

(b) SENSE OF CONGRESS ON COORDINATION WITH FEDERAL AVIATION ADMINISTRATION.—It is the sense of Congress that—

(1) NASA should continue—

(A) to coordinate with the Federal Aviation Administration on research on air traffic management systems for unmanned aircraft systems; and

(B) to assist the Federal Aviation Administration in the integration of air traffic management systems for unmanned aircraft systems into the national airspace system; and

(2) the test ranges (as defined in section 44801 of title 49, United States Code) should continue to be leveraged for research on—

(A) air traffic management systems for unmanned aircraft systems; and

(B) the integration of such systems into the national airspace system.

SEC. 405. 21ST CENTURY AERONAUTICS CAPABILITIES INITIATIVE.

(a) IN GENERAL.—The Administrator may establish an initiative, to be known as the "21st Century Aeronautics Capabilities Initiative", within the Construction and Environmental Compliance and Restoration Account, to ensure that NASA possesses the infrastructure and capabilities necessary to conduct proposed flight demonstration projects across the range of NASA aeronautics interests.

(b) ACTIVITIES.—In carrying out the 21st Century Aeronautics Capabilities Initiative, the Administrator may carry out the following activities:

(1) Any investments the Administrator considers necessary to upgrade and create facilities for civil and national security aeronautics research to support advancements in—

(A) long-term foundational science and technology;

(B) advanced aircraft systems;

(C) air traffic management systems;

(D) fuel efficiency;

(E) electric propulsion technologies;

(F) system-wide safety assurance;

(G) autonomous aviation; and

(H) supersonic and hypersonic aircraft design and development.

(2) Any measures the Administrator considers necessary to support flight testing activities, including—

(A) continuous refinement and development of free-flight test techniques and methodologies;

(B) upgrades and improvements to real-time tracking and data acquisition; and

(C) such other measures relating to aeronautics research support and modernization as the Administrator considers appropriate to carry out the scientific study of the problems of flight, with a view to practical solutions for such problems.

SEC. 406. SENSE OF CONGRESS ON ON-DEMAND AIR TRANSPORTATION.

It is the sense of Congress that—

(1) greater use of high-speed air transportation, small airports, helipads, vertical flight infrastructure, and other aviation-related infrastructure can alleviate

surface transportation congestion and support economic growth within cities;

(2) with respect to urban air mobility and related concepts, NASA should continue—

(A) to conduct research focused on concepts, technologies, and design tools; and

(B) to support the evaluation of advanced technologies and operational concepts that can be leveraged by—

(i) industry to develop future vehicles and systems; and

(ii) the Federal Aviation Administration to support vehicle safety and operational certification; and

(3) NASA should leverage ongoing efforts to develop advanced technologies to actively support the research needed for on-demand air transportation.

SEC. 407. SENSE OF CONGRESS ON HYPERSONIC TECHNOLOGY RESEARCH.

It is the sense of Congress that—

(1) hypersonic technology is critical to the development of advanced high-speed aerospace vehicles for both civilian and national security purposes;

(2) for hypersonic vehicles to be realized, research is needed to overcome technical challenges, including

in propulsion, advanced materials, and flight performance in a severe environment;

(3) NASA plays a critical role in supporting fundamental hypersonic research focused on system design, analysis and validation, and propulsion technologies;

(4) NASA research efforts in hypersonic technology should complement research supported by the Department of Defense to the maximum extent practicable, since contributions from both agencies working in partnership with universities and industry are necessary to overcome key technical challenges;

(5) previous coordinated research programs between NASA and the Department of Defense enabled important progress on hypersonic technology;

(6) the commercial sector could provide flight platforms and other capabilities that are able to host and support NASA hypersonic technology research projects; and

(7) in carrying out hypersonic technology research projects, the Administrator should—

(A) focus research and development efforts on high-speed propulsion systems, reusable vehicle technologies, high-temperature materials, and systems analysis;

(B) coordinate with the Department of Defense to prevent duplication of efforts and of investments;

(C) include partnerships with universities and industry to accomplish research goals; and

(D) maximize public-private use of commercially available platforms for hosting research and development flight projects.

TITLE V—SPACE TECHNOLOGY

SEC. 501. SPACE TECHNOLOGY MISSION DIRECTORATE.

(a) SENSE OF CONGRESS.—It is the sense of Congress that an independent Space Technology Mission Directorate is critical to ensuring continued investments in the development of technologies for missions across the portfolio of NASA, including science, aeronautics, and human exploration.

(b) SPACE TECHNOLOGY MISSION DIRECTORATE.—The Administrator shall maintain a Space Technology Mission Directorate consistent with section 702 of the National Aeronautics and Space Administration Transition Authorization Act of 2017 (51 U.S.C. 20301 note).

SEC. 502. FLIGHT OPPORTUNITIES PROGRAM.

(a) SENSE OF CONGRESS.—It is the sense of Congress that the Administrator should provide flight opportunities for payloads to microgravity environments and suborbital

altitudes as required by section 907(c) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18405(c)), as amended by subsection (b).

(b) ESTABLISHMENT.—Section 907(c) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18405(c)) is amended to read as follows:

"(c) ESTABLISHMENT.—

"(1) IN GENERAL.—The Administrator shall establish a Commercial Reusable Suborbital Research Program within the Space Technology Mission Directorate to fund—

"(A) the development of payloads for scientific research, technology development, and education;

"(B) flight opportunities for those payloads to microgravity environments and suborbital altitudes; and

"(C) transition of those payloads to orbital opportunities.

"(2) COMMERCIAL REUSABLE VEHICLE FLIGHTS.—In carrying out the Commercial Reusable Suborbital Research Program, the Administrator may fund engineering and integration demonstrations, proofs of concept, and educational experiments for flights of commercial reusable vehicles.

"(3) COMMERCIAL SUBORBITAL LAUNCH VEHICLES.—In carrying out the Commercial Reusable Suborbital Research Program, the Administrator may not fund the development of commercial suborbital launch vehicles.

"(4) WORKING WITH MISSION DIRECTORATES.—In carrying out the Commercial Reusable Suborbital Research Program, the Administrator shall work with the mission directorates of NASA to achieve the research, technology, and education goals of NASA.".

(c) CONFORMING AMENDMENT.—Section 907(b) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18405(b)) is amended, in the first sentence, by striking "Commercial Reusable Suborbital Research Program in" and inserting "Commercial Reusable Suborbital Research Program established under subsection (c)(1) within".

SEC. 503. SMALL SPACECRAFT TECHNOLOGY PROGRAM.

(a) SENSE OF CONGRESS.—It is the sense of Congress that the Small Spacecraft Technology Program is important for conducting science and technology validation for—

(1) short- and long-duration missions in low-Earth orbit;

(2) deep space missions; and

(3) deorbiting capabilities designed specifically for smaller spacecraft.

(b) ACCOMMODATION OF CERTAIN PAYLOADS.—In carrying out the Small Spacecraft Technology Program, the Administrator shall, as the mission risk posture and technology development objectives allow, accommodate science payloads that further the goal of long-term human exploration to the Moon and Mars.

SEC. 504. NUCLEAR PROPULSION TECHNOLOGY.

(a) SENSE OF CONGRESS.—It is the sense of Congress that nuclear propulsion is critical to the development of advanced spacecraft for civilian and national defense purposes.

(b) DEVELOPMENT; STUDIES.—The Administrator shall, in coordination with the Secretary of Energy and the Secretary of Defense—

(1) continue to develop the fuel element design for NASA nuclear propulsion technology;

(2) finalize the systems feasibility studies for such technology; and

(3) partner with members of commercial industry to conduct mission concept studies on such technology.

(c) NUCLEAR PROPULSION TECHNOLOGY DEMONSTRATION.—

(1) DETERMINATION; REPORT.—Not later than December 31, 2021, the Administrator shall—

(A) determine the correct approach for conducting a flight demonstration of nuclear propulsion technology; and

(B) submit to Congress a report on a plan for such a demonstration.

(2) DEMONSTRATION.—Not later than December 31, 2024, the Administrator shall conduct the flight demonstration described in paragraph (1).

SEC. 505. MARS-FORWARD TECHNOLOGIES.

(a) SENSE OF CONGRESS.—It is the sense of Congress that the Administrator should pursue multiple technical paths for entry, descent, and landing for Mars, including competitively selected technology demonstration missions.

(b) PRIORITIZATION OF LONG-LEAD TECHNOLOGIES AND SYSTEMS.—The Administrator shall prioritize, within the Space Technology Mission Directorate, research, testing, and development of long-lead technologies and systems for Mars, including technologies and systems relating to—

(1) entry, descent, and landing; and

(2) in-space propulsion, including nuclear propulsion, cryogenic fluid management, in-situ large-scale additive manufacturing, and electric propulsion (including solar electric propulsion leveraging lessons

learned from the power and propulsion element of the lunar outpost) options.

SEC. 506. PRIORITIZATION OF LOW-ENRICHED URANIUM TECHNOLOGY.

(a) SENSE OF CONGRESS.—It is the sense of Congress that—

(1) space technology, including nuclear propulsion technology and space surface power reactors, should be developed in a manner consistent with broader United States foreign policy, national defense, and space exploration and commercialization priorities;

(2) highly enriched uranium presents security and nuclear nonproliferation concerns;

(3) since 1977, based on the concerns associated with highly enriched uranium, the United States has promoted the use of low-enriched uranium over highly enriched uranium in nonmilitary contexts, including research and commercial applications;

(4) as part of United States efforts to limit international use of highly enriched uranium, the United States has actively pursued—

(A) since 1978, the conversion of domestic and foreign research reactors that use highly enriched uranium fuel to low-enriched uranium

fuel and the avoidance of any new research reactors that use highly enriched uranium fuel; and

(B) since 1994, the elimination of international commerce in highly enriched uranium for civilian purposes; and

(5) the use of low-enriched uranium in place of highly enriched uranium has security, nonproliferation, and economic benefits, including for the national space program.

(b) PRIORITIZATION OF LOW-ENRICHED URANIUM TECHNOLOGY.—The Administrator shall establish and prioritize, within the Space Technology Mission Directorate, a program for the research, testing, and development of a space surface power reactor design that uses low-enriched uranium fuel.

(c) REPORT ON NUCLEAR TECHNOLOGY PRIORITIZATION.—Not later than 120 days after the date of the enactment of this Act, the Administrator shall submit to the appropriate committees of Congress a report that—

(1) details the actions taken to implement subsection (b); and

(2) identifies a plan and timeline under which such subsection will be implemented.

(d) DEFINITIONS.—In this section:

(1) HIGHLY ENRICHED URANIUM.—The term "highly enriched uranium" means uranium having an assay of 20 percent or greater of the uranium-235 isotope.

(2) LOW-ENRICHED URANIUM.—The term "low-enriched uranium" means uranium having an assay greater than the assay for natural uranium but less than 20 percent of the uranium-235 isotope.

SEC. 507. SENSE OF CONGRESS ON NEXT-GENERATION COMMUNICATIONS TECHNOLOGY.

It is the sense of Congress that—

(1) optical communications technologies—

(A) will be critical to the development of next-generation space-based communications networks;

(B) have the potential to allow NASA to expand the volume of data transmissions in low-Earth orbit and deep space; and

(C) may provide more secure and cost-effective solutions than current radio frequency communications systems;

(2) quantum encryption technology has promising implications for the security of the satellite and terrestrial communications networks of the United States, including optical communications networks,

and further research and development by NASA with respect to quantum encryption is essential to maintaining the security of the United States and United States leadership in space; and

(3) in order to provide NASA with more secure and reliable space-based communications, the Space Communications and Navigation program office of NASA should continue—

(A) to support research on and development of optical communications; and

(B) to develop quantum encryption capabilities, especially as those capabilities apply to optical communications networks.

TITLE VI—STEM ENGAGEMENT

SEC. 601. SENSE OF CONGRESS.

It is the sense of Congress that—

(1) NASA serves as a source of inspiration to the people of the United States; and

(2) NASA is uniquely positioned to help increase student interest in science, technology, engineering, and math;

(3) engaging students, and providing hands-on experience at an early age, in science, technology, engineering, and math are important aspects of ensur-

ing and promoting United States leadership in innovation; and

(4) NASA should strive to leverage its unique position—

(A) to increase kindergarten through grade 12 involvement in NASA projects;

(B) to enhance higher education in STEM fields in the United States;

(C) to support individuals who are underrepresented in science, technology, engineering, and math fields, such as women, minorities, and individuals in rural areas; and

(D) to provide flight opportunities for student experiments and investigations.

SEC. 602. STEM EDUCATION ENGAGEMENT ACTIVITIES.

(a) IN GENERAL.—The Administrator shall continue to provide opportunities for formal and informal STEM education engagement activities within the Office of NASA STEM Engagement and other NASA directorates, including—

(1) the Established Program to Stimulate Competitive Research;

(2) the Minority University Research and Education Project; and

(3) the National Space Grant College and Fellowship Program.

(b) LEVERAGING NASA NATIONAL PROGRAMS TO PROMOTE STEM EDUCATION.—The Administrator, in partnership with museums, nonprofit organizations, and commercial entities, shall, to the maximum extent practicable, leverage human spaceflight missions, Deep Space Exploration Systems (including the Space Launch System, Orion, and Exploration Ground Systems), and NASA science programs to engage students at the kindergarten through grade 12 and higher education levels to pursue learning and career opportunities in STEM fields.

(c) BRIEFING.—Not later than 1 year after the date of the enactment of this Act, the Administrator shall brief the appropriate committees of Congress on—

(1) the status of the programs described in subsection (a); and

(2) the manner by which each NASA STEM education engagement activity is organized and funded.

(d) STEM EDUCATION DEFINED.—In this section, the term "STEM education" has the meaning given the term in section 2 of the STEM Education Act of 2015 (Public Law 114–59; 42 U.S.C. 6621 note).

SEC. 603. SKILLED TECHNICAL EDUCATION OUTREACH PROGRAM.

(a) ESTABLISHMENT.—The Administrator shall establish a program to conduct outreach to secondary school students—

(1) to expose students to careers that require career and technical education; and

(2) to encourage students to pursue careers that require career and technical education.

(b) OUTREACH PLAN.—Not later than 180 days after the date of the enactment of this Act, the Administrator shall submit to the appropriate committees of Congress a report on the outreach program under subsection (a) that includes—

(1) an implementation plan;

(2) a description of the resources needed to carry out the program; and

(3) any recommendations on expanding outreach to secondary school students interested in skilled technical occupations.

(c) SYSTEMS OBSERVATION.—

(1) IN GENERAL.—The Administrator shall develop a program and associated policies to allow students from accredited educational institutions to view the manufacturing, assembly, and testing of NASA-

funded space and aeronautical systems, as the Administrator considers appropriate.

(2) CONSIDERATIONS.—In developing the program and policies under paragraph (1), the Administrator shall take into consideration factors such as workplace safety, mission needs, and the protection of sensitive and proprietary technologies.

SEC. 604. NATIONAL SPACE GRANT COLLEGE AND FELLOWSHIP PROGRAM.

(a) PURPOSES.—Section 40301 of title 51, United States Code, is amended—

(1) in paragraph (3)—

(A) in subparagraph (B), by striking "and" at the end;

(B) in subparagraph (C), by adding "and" after the semicolon at the end; and

(C) by adding at the end the following:

"(D) promote equally the State and regional STEM interests of each space grant consortium;"; and

(2) in paragraph (4), by striking "made up of university and industry members, in order to advance" and inserting "comprised of members of universities in each State and other entities, such as 2-

year colleges, industries, science learning centers, museums, and government entities, to advance".

(b) DEFINITIONS.—Section 40302 of title 51, United States Code, is amended—

(1) by striking paragraph (3);

(2) by inserting after paragraph (2) the following:

"(3) LEAD INSTITUTION.—The term 'lead institution' means an entity in a State that—

"(A) was designated by the Administrator under section 40306, as in effect on the day before the date of the enactment of the National Aeronautics and Space Administration Authorization Act of 2019; or

"(B) is designated by the Administrator under section 40303(d)(3).";

(3) in paragraph (4), by striking "space grant college, space grant regional consortium, institution of higher education," and inserting "lead institution, space grant consortium,";

(4) by striking paragraphs (6), (7), and (8);

(5) by inserting after paragraph (5) the following:

"(6) SPACE GRANT CONSORTIUM.—The term 'space grant consortium' means a State-wide group,

led by a lead institution, that has established partnerships with other academic institutions, industries, science learning centers, museums, and government entities to promote a strong educational base in the space and aeronautical sciences.";

(6) by redesignating paragraph (9) as paragraph (7);

(7) in paragraph (7)(B), as so redesignated, by inserting "and aeronautics" after "space";

(8) by striking paragraph (10); and

(9) by adding at the end the following:

"(8) STEM.—The term 'STEM' means science, technology, engineering, and mathematics.".

(c) PROGRAM OBJECTIVE.—Section 40303 of title 51, United States Code, is amended—

(1) by striking subsections (d) and (e);

(2) by redesignating subsection (c) as subsection (e); and

(3) by striking subsection (b) and inserting the following:

"(b) PROGRAM OBJECTIVE.—

"(1) IN GENERAL.—The Administrator shall carry out the national space grant college and fellowship program with the objective of providing hands-on research, training, and education programs with

measurable outcomes in each State, including programs to provide—

"(A) internships, fellowships, and scholarships;

"(B) interdisciplinary hands-on mission programs and design projects;

"(C) student internships with industry or university researchers or at centers of the Administration;

"(D) faculty and curriculum development initiatives;

"(E) university-based research initiatives relating to the Administration and the STEM workforce needs of each State; or

"(F) STEM engagement programs for kindergarten through grade 12 teachers and students.

"(2) PROGRAM PRIORITIES.—In carrying out the objective described in paragraph (1), the Administrator shall ensure that each program carried out by a space grant consortium under the national space grant college and fellowship program balances the following priorities:

"(A) The space and aeronautics research needs of the Administration, including the mission directorates.

"(B) The need to develop a national STEM workforce.

"(C) The STEM workforce needs of the State.

"(c) PROGRAM ADMINISTERED THROUGH SPACE GRANT CONSORTIA.—The Administrator shall carry out the national space grant college and fellowship program through the space grant consortia.

"(d) SUSPENSION; TERMINATION; NEW COMPETITION.—

"(1) SUSPENSION.—The Administrator may, for cause and after an opportunity for hearing, suspend a lead institution that was designated by the Administrator under section 40306, as in effect on the day before the date of the enactment of the National Aeronautics and Space Administration Authorization Act of 2019.

"(2) TERMINATION.—If the issue resulting in a suspension under paragraph (1) is not resolved within a period determined by the Administrator, the Administrator may terminate the designation of the entity as a lead institution.

"(3) NEW COMPETITION.—If the Administrator terminates the designation of an entity as a lead institution, the Administrator may initiate a new competition in the applicable State for the designation of a lead institution.".

(d) GRANTS.—Section 40304 of title 51, United States Code, is amended to read as follows:

"§ 40304. Grants

"(a) ELIGIBLE SPACE GRANT CONSORTIUM DEFINED.—In this section, the term 'eligible space grant consortium' means a space grant consortium that the Administrator has determined—

"(1) has the capability and objective to carry out not fewer than 3 of the 6 programs under section 40303(b)(1);

"(2) will carry out programs that balance the priorities described in section 40303(b)(2); and

"(3) is engaged in research, training, and education relating to space and aeronautics.

"(b) GRANTS.—

"(1) IN GENERAL.—The Administrator shall award grants to the lead institutions of eligible space grant consortia to carry out the programs under section 40303(b)(1).

"(2) REQUEST FOR PROPOSALS.—

"(A) IN GENERAL.—Not later than 180 days after the date of the enactment of the National Aeronautics and Space Administration Authorization Act of 2019, the Administrator shall issue a request for proposals from space grant consortia for the award of grants under this section.

"(B) APPLICATIONS.—A lead institution of a space grant consortium that seeks a grant under this section shall submit, on behalf of such space grant consortium, an application to the Administrator at such time, in such manner, and accompanied by such information as the Administrator may require.

"(3) GRANT AWARDS.—The Administrator shall award 1 or more 5-year grants, disbursed in annual installments, to the lead institution of the eligible space grant consortium of—

"(A) each State;

"(B) the District of Columbia; and

"(C) the Commonwealth of Puerto Rico.

"(4) USE OF FUNDS.—A grant awarded under this section shall be used by an eligible space grant consortium to carry out not fewer than 3 of the 6 programs under section 40303(b)(1).

"(c) ALLOCATION OF FUNDING.—

"(1) PROGRAM IMPLEMENTATION.—

"(A) IN GENERAL.—To carry out the objective described in section 40303(b)(1), of the funds made available each fiscal year for the national space grant college and fellowship program, the Administrator shall allocate not less than 85 percent as follows:

"(i) The 52 eligible space grant consortia shall each receive an equal share.

"(ii) The territories of Guam and the United States Virgin Islands shall each receive funds equal to approximately 1/5 of the share for each eligible space grant consortia.

"(B) MATCHING REQUIREMENT.—Each eligible space grant consortium shall match the funds allocated under subparagraph (A)(i) on a basis of not less than 1 non-Federal dollar for every 1 Federal dollar, except that any program funded under paragraph (3) or any program to carry out 1 or more internships or fellowships shall not be subject to that matching requirement.

"(2) PROGRAM ADMINISTRATION.—

"(A) IN GENERAL.—Of the funds made available each fiscal year for the national space grant college and fellowship program, the Administrator shall allocate not more than 10 percent for the administration of the program.

"(B) COSTS COVERED.—The funds allocated under subparagraph (A) shall cover all costs of the Administration associated with the administration of the national space grant college and fellowship program, including—

"(i) direct costs of the program, including costs relating to support services and civil service salaries and benefits;

"(ii) indirect general and administrative costs of centers and facilities of the Administration; and

"(iii) indirect general and administrative costs of the Administration headquarters.

"(3) SPECIAL PROGRAMS.—Of the funds made available each fiscal year for the national space grant college and fellowship program, the Administrator shall allocate not more than 5 percent to the lead institutions of space grant consortia established as of the date of the enactment of the National Aeronautics

and Space Administration Authorization Act of 2019 for grants to carry out innovative approaches and programs to further science and education relating to the missions of the Administration and STEM disciplines.

"(d) TERMS AND CONDITIONS.—

"(1) LIMITATIONS.—Amounts made available through a grant under this section may not be applied to—

"(A) the purchase of land;

"(B) the purchase, construction, preservation, or repair of a building; or

"(C) the purchase or construction of a launch facility or launch vehicle.

"(2) LEASES.—Notwithstanding paragraph (1), land, buildings, launch facilities, and launch vehicles may be leased under a grant on written approval by the Administrator.

"(3) RECORDS.—

"(A) IN GENERAL.—Any person that receives or uses the proceeds of a grant under this section shall keep such records as the Administrator shall by regulation prescribe as being necessary and appropriate to facilitate effective audit and evaluation, including records that

fully disclose the amount and disposition by a recipient of such proceeds, the total cost of the program or project in connection with which such proceeds were used, and the amount, if any, of such cost that was provided through other sources.

"(B) MAINTENANCE OF RECORDS.—Records under subparagraph (A) shall be maintained for not less than 3 years after the date of completion of such a program or project.

"(C) ACCESS.—For the purpose of audit and evaluation, the Administrator and the Comptroller General of the United States shall have access to any books, documents, papers, and records of receipts relating to a grant under this section, as determined by the Administrator or Comptroller General.".

(e) PROGRAM STREAMLINING.—Title 51, United States Code, is amended—

(1) by striking sections 40305 through 40308, 40310, and 40311; and

(2) by redesignating section 40309 as section 40305.

(f) CONFORMING AMENDMENT.—The table of sections at the beginning of chapter 403 of title 51, United States

Code, is amended by striking the items relating to sections 40304 through 40311 and inserting the following:

"40304. Grants.
"40305. Availability of other Federal personnel and data.".

TITLE VII—WORKFORCE AND INDUSTRIAL BASE

SEC. 701. APPOINTMENT AND COMPENSATION PILOT PROGRAM.

(a) DEFINITION OF COVERED PROVISIONS.—In this section, the term "covered provisions" means the provisions of title 5, United States Code, other than—

(1) section 2301 of that title;

(2) section 2302 of that title;

(3) chapter 71 of that title;

(4) section 7204 of that title; and

(5) chapter 73 of that title.

(b) ESTABLISHMENT.—There is established a 3-year pilot program under which, notwithstanding section 20113 of title 51, United States Code, the Administrator may, with respect to not more than 5,000 designated personnel—

(1) appoint and manage such designated personnel of the Administration, without regard to the covered provisions; and

(2) fix the compensation of such designated personnel of the Administration, without regard to chapter 51 and subchapter III of chapter 53 of title 5,

United States Code, at a rate that does not exceed the per annum rate of salary of the Vice President of the United States under section 104 of title 3, United States Code.

(c) ADMINISTRATOR RESPONSIBILITIES.—In carrying out the pilot program established under subsection (b), the Administrator shall ensure that the pilot program—

(1) uses—

(A) state-of-the-art recruitment techniques;

(B) simplified classification methods with respect to personnel of the Administration; and

(C) broad banding; and

(2) offers—

(A) competitive compensation; and

(B) the opportunity for career mobility.

SEC. 702. ESTABLISHMENT OF MULTI-INSTITUTION CONSORTIA AND UNIVERSITY-AFFILIATED RESEARCH CENTERS.

(a) IN GENERAL.—The Administrator, pursuant to section 2304(c)(3)(B) of title 10, United States Code, may—

(1) establish one or more multi-institution consortia or university-affiliated research centers to facilitate access to essential engineering, research, and

development capabilities in support of NASA missions;

(2) use such a consortium or research center to fund technical analyses and other engineering support to address the acquisition, technical, and operational needs of NASA centers; and

(3) ensure such a consortium or research center—

(A) is held accountable for the technical quality of the work product developed under this section; and

(B) convenes disparate groups to facilitate public-private partnerships.

(b) POLICIES AND PROCEDURES.—The Administrator shall develop and implement policies and procedures to govern, with respect to the establishment of a consortium or research center under subsection (a)—

(1) the selection of participants;

(2) the award of cooperative agreements or other contracts;

(3) the appropriate use of competitive awards and sole source awards; and

(4) technical capabilities required.

(c) ELIGIBILITY.—The following entities shall be eligible to participate in a consortium or research center established under subsection (a):

(1) An institution of higher education (as defined in section 102 of the Higher Education Act of 1965 (20 U.S.C. 1002)).

(2) An operator of a federally funded research and development center.

(3) A nonprofit or not-for-profit research institution.

(4) A consortium composed of—

(A) an entity described in paragraph (1), (2), or (3); and

(B) one or more for-profit entities.

SEC. 703. EXPEDITED ACCESS TO TECHNICAL TALENT AND EXPERTISE.

(a) IN GENERAL.—The Administrator may—

(1) establish one or more multi-institution task order contracts, consortia, cooperative agreements, or other arrangements to facilitate expedited access to eligible entities in support of NASA missions; and

(2) use such a multi-institution task order contract, consortium, cooperative agreement, or other arrangement to fund technical analyses and other engi-

neering support to address the acquisition, technical, and operational needs of NASA centers.

(b) CONSULTATION WITH OTHER NASA-AFFILIATED ENTITIES.—To ensure access to technical expertise and reduce costs and duplicative efforts, a multi-institution task order contract, consortium, cooperative agreement, or any other arrangement established under subsection (a)(1) shall, to the maximum extent practicable, be carried out in consultation with other NASA-affiliated entities, including federally funded research and development centers, university-affiliated research centers, and NASA laboratories and test centers.

(c) POLICIES AND PROCEDURES.—The Administrator shall develop and implement policies and procedures to govern, with respect to the establishment of a multi-institution task order contract, consortium, cooperative agreement, or any other arrangement under subsection (a)(1)—

(1) the selection of participants;

(2) the award of task orders;

(3) the maximum award size for a task;

(4) the appropriate use of competitive awards and sole source awards; and

(5) technical capabilities required.

(d) ELIGIBLE ENTITY DEFINED.—In this section, the term "eligible entity" means—

(1) an institution of higher education (as defined in section 102 of the Higher Education Act of 1965 (20 U.S.C. 1002));

(2) an operator of a federally funded research and development center;

(3) a nonprofit or not-for-profit research institution; and

(4) a consortium composed of—

(A) an entity described in paragraph (1), (2), or (3); and

(B) one or more for-profit entities.

SEC. 704. REPORT ON INDUSTRIAL BASE FOR CIVIL SPACE MISSIONS AND OPERATIONS.

(a) IN GENERAL.—Not later than 1 year after the date of the enactment of this Act, and from time to time thereafter, the Administrator shall submit to the appropriate committees of Congress a report on the United States industrial base for NASA civil space missions and operations.

(b) ELEMENTS.—The report required by subsection (a) shall include the following:

(1) A comprehensive description of the current status of the United States industrial base for NASA civil space missions and operations.

(2) A description and assessment of the weaknesses in the supply chain, skills, manufacturing ca-

pacity, raw materials, key components, and other areas of the United States industrial base for NASA civil space missions and operations that could adversely impact such missions and operations if unavailable.

(3) A description and assessment of various mechanisms to address and mitigate the weaknesses described pursuant to paragraph (2).

(4) A comprehensive list of the collaborative efforts, including future and proposed collaborative efforts, between NASA and the Manufacturing USA institutes of the Department of Commerce.

(5) An assessment of—

(A) the defense and aerospace manufacturing supply chains relevant to NASA in each region of the United States; and

(B) the feasibility and benefits of establishing a supply chain center of excellence in a State in which NASA does not, as of the date of the enactment of this Act, have a research center or test facility.

(6) Such other matters relating to the United States industrial base for NASA civil space missions and operations as the Administrator considers appropriate.

SEC. 705. SEPARATIONS AND RETIREMENT INCENTIVES.

Section 20113 of title 51, United States Code, is amended by adding at the end the following:

"(o) PROVISIONS RELATED TO SEPARATION AND RETIREMENT INCENTIVES.—

"(1) DEFINITION.—In this subsection, the term 'employee'—

"(A) means an employee of the Administration serving under an appointment without time limitation; and

"(B) does not include—

"(i) a reemployed annuitant under subchapter III of chapter 83 or chapter 84 of title 5 or any other retirement system for employees of the Federal Government;

"(ii) an employee having a disability on the basis of which such employee is or would be eligible for disability retirement under any of the retirement systems referred to in clause (i); or

"(iii) for purposes of eligibility for separation incentives under this subsection, an employee who is in receipt of a decision notice of involuntary separation for misconduct or unacceptable performance.

"(2) AUTHORITY.—The Administrator may establish a program under which employees may be eligible for early retirement, offered separation incentive pay to separate from service voluntarily, or both. This authority may be used to reduce the number of personnel employed or to restructure the workforce to meet mission objectives without reducing the overall number of personnel. This authority is in addition to, and notwithstanding, any other authorities established by law or regulation for such programs.

"(3) EARLY RETIREMENT.—An employee who is at least 50 years of age and has completed 20 years of service, or has at least 25 years of service, may, pursuant to regulations promulgated under this subsection, apply and be retired from the Administration and receive benefits in accordance with subchapter III of chapter 83 or 84 of title 5 if the employee has been employed continuously within the Administration for more than 30 days before the date on which the determination to conduct a reduction or restructuring within 1 or more Administration centers is approved.

"(4) SEPARATION PAY.—

"(A) IN GENERAL.—Separation pay shall be paid in a lump sum or in installments and shall be equal to the lesser of—

"(i) an amount equal to the amount the employee would be entitled to receive under section 5595(c) of title 5, if the employee were entitled to payment under such section; or

"(ii) $40,000.

"(B) LIMITATIONS.—Separation pay shall not be a basis for payment, and shall not be included in the computation, of any other type of Government benefit. Separation pay shall not be taken into account for the purpose of determining the amount of any severance pay to which an individual may be entitled under section 5595 of title 5, based on any other separation.

"(C) INSTALLMENTS.—Separation pay, if paid in installments, shall cease to be paid upon the recipient's acceptance of employment by the Federal Government, or commencement of work under a personal services contract as described in paragraph (5).

"(5) LIMITATIONS ON REEMPLOYMENT.—

"(A) An employee who receives separation pay under such program may not be reemployed by the Administration for a 12-month period be-

ginning on the effective date of the employee's separation, unless this prohibition is waived by the Administrator on a case-by-case basis.

"(B) An employee who receives separation pay under this section on the basis of a separation and accepts employment with the Government of the United States, or who commences work through a personal services contract with the United States within 5 years after the date of the separation on which payment of the separation pay is based, shall be required to repay the entire amount of the separation pay to the Administration. If the employment is with an Executive agency (as defined by section 105 of title 5) other than the Administration, the Administrator may, at the request of the head of that agency, waive the repayment if the individual involved possesses unique abilities and is the only qualified applicant available for the position. If the employment is within the Administration, the Administrator may waive the repayment if the individual involved is the only qualified applicant available for the position. If the employment is with an entity in the legislative branch, the head of the entity or the appointing

official may waive the repayment if the individual involved possesses unique abilities and is the only qualified applicant available for the position. If the employment is with the judicial branch, the Director of the Administrative Office of the United States Courts may waive the repayment if the individual involved possesses unique abilities and is the only qualified applicant available for the position.

"(6) REGULATIONS.—Under the program established under paragraph (2), early retirement and separation pay may be offered only pursuant to regulations established by the Administrator, subject to such limitations or conditions as the Administrator may require.

"(7) USE OF EXISTING FUNDS.—The Administrator shall carry out this subsection using amounts otherwise made available to the Administrator and no additional funds are authorized to be appropriated to carry out this subsection.".

SEC. 706. CONFIDENTIALITY OF MEDICAL QUALITY ASSURANCE RECORDS.

(a) IN GENERAL.—Chapter 313 of title 51, United States Code, is amended by adding at the end the following:

"§ 31303. Confidentiality of medical quality assurance records

"(a) IN GENERAL.—Except as provided in subsection (b)(1)—

"(1) a medical quality assurance record, or any part of a medical quality assurance record, may not be subject to discovery or admitted into evidence in a judicial or administrative proceeding; and

"(2) an individual who reviews or creates a medical quality assurance record for the Administration, or participates in any proceeding that reviews or creates a medical quality assurance record, may not testify in a judicial or administrative proceeding with respect to—

"(A) the medical quality assurance record; or

"(B) any finding, recommendation, evaluation, opinion, or action taken by such individual or in accordance with such proceeding with respect to the medical quality assurance record.

"(b) DISCLOSURE OF RECORDS.—

"(1) IN GENERAL.—Notwithstanding subsection (a), a medical quality assurance record may be disclosed to—

"(A) a Federal agency or private entity, if the medical quality assurance record is necessary

for the Federal agency or private entity to carry out—

"(i) licensing or accreditation functions relating to Administration healthcare facilities; or

"(ii) monitoring of Administration healthcare facilities required by law;

"(B) a Federal agency or healthcare provider, if the medical quality assurance record is required by the Federal agency or healthcare provider to enable Administration participation in a healthcare program of the Federal agency or healthcare provider;

"(C) a criminal or civil law enforcement agency, or an instrumentality authorized by law to protect the public health or safety, on written request by a qualified representative of such agency or instrumentality submitted to the Administrator that includes a description of the lawful purpose for which the medical quality assurance record is requested;

"(D) an officer, an employee, or a contractor of the Administration who requires the medical quality assurance record to carry out an official duty associated with healthcare;

"(E) healthcare personnel, to the extent necessary to address a medical emergency affecting the health or safety of an individual; and

"(F) any committee, panel, or board convened by the Administration to review the healthcare-related policies and practices of the Administration.

"(2) SUBSEQUENT DISCLOSURE PROHIBITED.—An individual or entity to whom a medical quality assurance record has been disclosed under paragraph (1) may not make a subsequent disclosure of the medical quality assurance record.

"(c) PERSONALLY IDENTIFIABLE INFORMATION.—

"(1) IN GENERAL.—Except as provided in paragraph (2), the personally identifiable information contained in a medical quality assurance record of a patient or an employee of the Administration, or any other individual associated with the Administration for purposes of a medical quality assurance program, shall be removed before the disclosure of the medical quality assurance record to an entity other than the Administration.

"(2) EXCEPTION.— Personally identifiable information described in paragraph (1) may be released to an entity other than the Administration if the Ad-

ministrator makes a determination that the release of such personally identifiable information—

"(A) is in the best interests of the Administration; and

"(B) does not constitute an unwarranted invasion of personal privacy.

"(d) EXCLUSION FROM FOIA.—A medical quality assurance record may not be made available to any person under section 552 of title 5, United States Code (commonly referred to as the 'Freedom of Information Act'), and this section shall be considered a statute described in subsection (b)(3)(B) of such section 522.

"(e) REGULATIONS.—Not later than one year after the date of the enactment of this section, the Administrator shall promulgate regulations to implement this section.

"(f) RULES OF CONSTRUCTION.—Nothing in this section shall be construed—

"(1) to withhold a medical quality assurance record from a committee of the Senate or House of Representatives or a joint committee of Congress if the medical quality assurance record relates to a matter within the jurisdiction of such committee or joint committee; or

"(2) to limit the use of a medical quality assurance record within the Administration, including the

use by a contractor or consultant of the Administration.

"(g) DEFINITIONS.—In this section:

"(1) MEDICAL QUALITY ASSURANCE RECORD.—The term 'medical quality assurance record' means any proceeding, discussion, record, finding, recommendation, evaluation, opinion, minutes, report, or other document or action that results from a quality assurance committee, quality assurance program, or quality assurance program activity.

"(2) QUALITY ASSURANCE PROGRAM.—

"(A) IN GENERAL.—The term 'quality assurance program' means a comprehensive program of the Administration—

"(i) to systematically review and improve the quality of medical and behavioral health services provided by the Administration to ensure the safety and security of individuals receiving such health services; and

"(ii) to evaluate and improve the efficiency, effectiveness, and use of staff and resources in the delivery of such health services.

"(B) INCLUSION.—The term 'quality assurance program' includes any activity carried out

by or for the Administration to assess the quality of medical care provided by the Administration.".

(b) TECHNICAL AND CONFORMING AMENDMENT.—The table of sections for chapter 313 of title 51, United States Code, is amended by adding at the end the following:

"31303. Confidentiality of medical quality assurance records.".

TITLE VIII—MISCELLANEOUS PROVISIONS

SEC. 801. CONTRACTING AUTHORITY.

Section 20113 of title 51, United States Code, as amended by section 705, is further amended by adding at the end the following:

"(p) CONTRACTING AUTHORITY.—The Administration—

"(1) may enter into an agreement with a private, commercial, or State government entity to provide the entity with supplies, support, and services related to private, commercial, or State government space activities carried out at a property owned or operated by the Administration; and

"(2) upon the request of such an entity, may include such supplies, support, and services in the requirements of the Administration if—

"(A) the Administrator determines that the inclusion of such supplies, support, or services in such requirements—

"(i) is in the best interest of the Federal Government;

"(ii) does not interfere with the requirements of the Administration; and

"(iii) does not compete with the commercial space activities of other such entities; and

"(B) the Administration has full reimbursable funding from the entity that requested supplies, support, and services prior to making any obligation for the delivery of such supplies, support, or services under an Administration procurement contract or any other agreement.".

SEC. 802. AUTHORITY FOR TRANSACTION PROTOTYPE PROJECTS AND FOLLOW-ON PRODUCTION CONTRACTS.

Section 20113 of title 51, United States Code, as amended by section 801, is further amended by adding at the end the following:

"(q) TRANSACTION PROTOTYPE PROJECTS AND FOLLOW-ON PRODUCTION CONTRACTS.—

"(1) IN GENERAL.—The Administration may enter into a transaction (other than a contract, cooperative agreement, or grant) to carry out a prototype project that is directly relevant to enhancing the mission effectiveness of the Administration.

"(2) SUBSEQUENT AWARD OF FOLLOW-ON PRODUCTION CONTRACT.—A transaction entered into under this subsection for a prototype project may provide for the subsequent award of a follow-on production contract to participants in the transaction.

"(3) INCLUSION.—A transaction under this subsection includes a project awarded to an individual participant and to all individual projects awarded to a consortium of United States industry and academic institutions.

"(4) DETERMINATION.—The authority of this section may be exercised for a transaction for a prototype project and any follow-on production contract, upon a determination by the head of the contracting activity, in accordance with Administration policies, that—

"(A) circumstances justify use of a transaction to provide an innovative business arrangement that would not be feasible or appropriate under a contract; and

"(B) the use of the authority of this section is essential to promoting the success of the prototype project.

"(5) COMPETITIVE PROCEDURE.—

"(A) IN GENERAL.—To the maximum extent practicable, the Administrator shall use competitive procedures with respect to entering into a transaction to carry out a prototype project.

"(B) EXCEPTION.—Notwithstanding section 2304 of title 10, United States Code, a follow-on production contract may be awarded to the participants in the prototype transaction without the use of competitive procedures, if—

"(i) competitive procedures were used for the selection of parties for participation in the prototype transaction; and

"(ii) the participants in the transaction successfully completed the prototype project provided for in the transaction.

"(6) COST SHARE.—A transaction to carry out a prototype project and a follow-on production contract may require that part of the total cost of the transaction or contract be paid by the participant or

contractor from a source other than the Federal Government.

"(7) PROCUREMENT ETHICS.—A transaction under this authority shall be considered an agency procurement for purposes of chapter 21 of title 41, United States Code, with regard to procurement ethics.".

SEC. 803. PROTECTION OF DATA AND INFORMATION FROM PUBLIC DISCLOSURE.

(a) CERTAIN TECHNICAL DATA.—Section 20131 of title 51, United States Code, is amended—

(1) by redesignating subsection (c) as subsection (d);

(2) in subsection (a)(3), by striking "subsection (b)" and inserting "subsection (b) or (c)";

(3) by inserting after subsection (b) the following:

"(c) SPECIAL HANDLING OF CERTAIN TECHNICAL DATA.—

"(1) IN GENERAL.—The Administrator may provide appropriate protections against the public dissemination of certain technical data, including exemption from subchapter II of chapter 5 of title 5.

"(2) DEFINITIONS.—In this subsection:

"(A) CERTAIN TECHNICAL DATA.—The term 'certain technical data' means technical data that may not be exported lawfully outside the United States without approval, authorization, or license under—

"(i) the Export Control Reform Act of 2018 (Public Law 115–232; 132 Stat. 2208); or

"(ii) the International Security Assistance and Arms Export Control Act of 1976 (Public Law 94–329; 90 Stat. 729).

"(B) TECHNICAL DATA.—The term 'technical data' means any blueprint, drawing, photograph, plan, instruction, computer software, or documentation, or any other technical information.";

(4) in subsection (d), as so redesignated, by inserting ", including any data," after "information"; and

(5) by adding at the end the following:

"(e) EXCLUSION FROM FOIA.—This section shall be considered a statute described in subsection (b)(3)(B) of section 552 of title 5 (commonly referred to as the 'Freedom of Information Act').".

(b) CERTAIN VOLUNTARILY PROVIDED SAFETY-RELATED INFORMATION.—

(1) IN GENERAL.—The Administrator shall provide appropriate safeguards against the public dissemination of safety-related information collected as part of a mishap investigation carried out under the NASA safety reporting system or in conjunction with an organizational safety assessment, if the Administrator makes a written determination, including a justification of the determination, that—

(A)(i) disclosure of the information would inhibit individuals from voluntarily providing safety-related information; and

(ii) the ability of NASA to collect such information improves the safety of NASA programs and research relating to aeronautics and space; or

(B) withholding such information from public disclosure improves the safety of such NASA programs and research.

(2) OTHER FEDERAL AGENCIES.—Notwithstanding any other provision of law, if the Administrator provides to the head of another Federal agency safety-related information with respect to which the Administrator has made a determination under para-

graph (1), the head of the Federal agency shall withhold the information from public disclosure.

(3) PUBLIC AVAILABILITY.—A determination under paragraph (1) shall be made available to the public on request, as required under section 552 of title 5, United States Code (commonly referred to as the "Freedom of Information Act").

(4) EXCLUSION FROM FOIA.—This subsection shall be considered a statute described in subsection (b)(3)(B) of section 552 of title 5, United States Code.

SEC. 804. PHYSICAL SECURITY MODERNIZATION.

Chapter 201 of title 51, United States Code, is amended—

(1) in section 20133(2), by striking "property" and all that follows through "to the United States," and inserting "Administration personnel or of property owned or leased by, or under the control of, the United States"; and

(2) in section 20134, in the second sentence—

(A) by inserting "Administration personnel or any" after "protecting"; and

(B) by striking ", at facilities owned or contracted to the Administration".

SEC. 805. LEASE OF NON-EXCESS PROPERTY.

Section 20145 of title 51, United States Code, is amended—

(1) in paragraph (b)(1)(B), by striking "entered into for the purpose of developing renewable energy production facilities"; and

(2) by striking subsection (g).

SEC. 806. CYBERSECURITY.

(a) IN GENERAL.—Section 20301 of title 51, United States Code, is amended by adding at the end the following:

"(c) CYBERSECURITY.—The Administrator shall update and improve the cybersecurity of NASA space assets and supporting infrastructure.".

(b) SECURITY OPERATIONS CENTER.—

(1) ESTABLISHMENT.—The Administrator shall maintain a Security Operations Center, to identify and respond to cybersecurity threats to NASA information technology systems, including institutional systems and mission systems.

(2) INSPECTOR GENERAL RECOMMENDATIONS.—The Administrator shall implement, to the maximum extent practicable, each of the recommendations contained in the report of the Inspector General of NASA entitled "Audit of NASA's Security Operations Center", issued on May 23, 2018.

(c) CYBER THREAT HUNT.—

(1) IN GENERAL.—The Administrator, in coordination with the Secretary of Homeland Security and the heads of other relevant Federal agencies, may implement a cyber threat hunt capability to proactively search NASA information systems for advanced cyber threats that otherwise evade existing security tools.

(2) THREAT-HUNTING PROCESS.—In carrying out paragraph (1), the Administrator shall develop and document a threat-hunting process, including the roles and responsibilities of individuals conducting a cyber threat hunt.

(d) GAO PRIORITY RECOMMENDATIONS.—The Administrator shall implement, to the maximum extent practicable, the recommendations for NASA contained in the report of the Comptroller General of the United States entitled "Information Security: Agencies Need to Improve Controls over Selected High-Impact Systems", issued May 18, 2016, including—

(1) re-evaluating security control assessments; and

(2) specifying metrics for the continuous monitoring strategy of the Administration.

SEC. 807. LIMITATION ON COOPERATION WITH THE PEOPLE'S REPUBLIC OF CHINA.

(a) IN GENERAL.—Except as provided by subsection (b), the Administrator, the Director of the Office of Science and Technology Policy, and the Chair of the National Space Council, shall not—

(1) develop, design, plan, promulgate, implement, or execute a bilateral policy, program, order, or contract of any kind to participate, collaborate, or coordinate bilaterally in any manner with—

(A) the Government of the People's Republic of China; or

(B) any company—

(i) owned by the Government of the People's Republic of China; or

(ii) incorporated under the laws of the People's Republic of China; and

(2) host official visitors from the People's Republic of China at a facility belonging to or used by NASA.

(b) WAIVER.—

(1) IN GENERAL.—The Administrator, the Director, or the Chair may waive the limitation under subsection (a) with respect to an activity described in that subsection only if the Administrator, the Direc-

tor, or the Chair, as applicable, makes a determination that the activity—

(A) does not pose a risk of a transfer of technology, data, or other information with national security or economic security implications to an entity described in paragraph (1) of such subsection; and

(B) does not involve knowing interactions with officials who have been determined by the United States to have direct involvement with violations of human rights.

(2) CERTIFICATION TO CONGRESS.—Not later than 30 days after the date on which a waiver is granted under paragraph (1), the Administrator, the Director, or the Chair, as applicable, shall submit to the Committee on Commerce, Science, and Transportation and the Committee on Appropriations of the Senate and the Committee on Science, Space, and Technology and the Committee on Appropriations of the House of Representatives a written certification that the activity complies with the requirements in subparagraphs (A) and (B) of that paragraph.

(c) GAO REVIEW.—

(1) IN GENERAL.—The Comptroller General of the United States shall conduct a review of NASA

contracts that may subject the Administration to unacceptable transfers of intellectual property or technology to any entity—

(A) owned or controlled (in whole or in part) by, or otherwise affiliated with, the Government of the People's Republic of China; or

(B) organized under, or otherwise subject to, the laws of the People's Republic of China.

(2) ELEMENTS.—The review required under paragraph (1) shall assess—

(A) whether the Administrator is aware—

(i) of any NASA contractor that benefits from significant financial assistance from—

(I) the Government of the People's Republic of China;

(II) any entity controlled by the Government of the People's Republic of China; or

(III) any other governmental entity of the People's Republic of China; and

(ii) that the Government of the People's Republic of China, or an entity controlled

by the Government of the People's Republic of China, may be—

(I) leveraging United States companies that share ownership with NASA contractors; or

(II) obtaining intellectual property or technology illicitly or by other unacceptable means; and

(B) the steps the Administrator is taking to ensure that—

(i) NASA contractors are not being leveraged (directly or indirectly) by the Government of the People's Republic of China or by an entity controlled by the Government of the People's Republic of China;

(ii) the intellectual property and technology of NASA contractors are adequately protected; and

(iii) NASA flight-critical components are not sourced from the People's Republic of China through any entity benefiting from Chinese investments, loans, or other assistance.

(3) RECOMMENDATIONS.—The Comptroller General shall provide to the Administrator recommenda-

tions for future NASA contracting based on the results of the review.

(4) PLAN.—Not later than 180 days after the date on which the Comptroller General completes the review, the Administrator shall—

(A) develop a plan to implement the recommendations of the Comptroller General; and

(B) submit the plan to the appropriate committees of Congress.

SEC. 808. CONSIDERATION OF ISSUES RELATED TO CONTRACTING WITH ENTITIES RECEIVING ASSISTANCE FROM OR AFFILIATED WITH THE PEOPLE'S REPUBLIC OF CHINA.

In considering any response to a request for proposal, request for information, broad area announcement, or any other form of request or solicitation, and in considering or undertaking any negotiation or conclusion of any contract, agreement, or other transaction with any commercial or non-commercial entity, the Administrator shall, in consultation with appropriate Federal departments and agencies, take into account the implications of any benefit received by such commercial or non-commercial entity (or any other commercial or non-commercial entity related through ownership, control, or other affiliation to such enti-

ty) as a result of a significant loan or other financial assistance provided by—

(1) any governmental organization of the People's Republic of China; or

(2) any other entity that is—

(A) owned or controlled by, or otherwise affiliated with, any governmental organization of the People's Republic of China; or

(B) organized under, or otherwise subject to, the laws of the People's Republic of China.

SEC. 809. SMALL SATELLITE LAUNCH SERVICES PROGRAM.

(a) IN GENERAL.—The Administrator shall continue to procure dedicated launch services for small satellites, including CubeSats, for the purpose of conducting science and technology missions that further the goals of NASA.

(b) REQUIREMENTS.—In carrying out the program under subsection (a), the Administrator shall—

(1) engage with the academic community to maximize awareness and use of dedicated small satellite launch opportunities; and

(2) to the maximum extent practicable, use a secondary payload of procured launch services for CubeSats.

SEC. 810. 21ST CENTURY SPACE LAUNCH INFRASTRUCTURE.

(a) IN GENERAL.—The Administrator shall carry out a program to modernize launch infrastructure at NASA facilities—

(1) to enhance safety; and

(2) to advance Government and commercial space transportation and exploration.

(b) PROJECTS.—Projects funded under the program under subsection (a) may include—

(1) infrastructure relating to commodities;

(2) standard interfaces to meet customer needs for multiple payload processing and launch vehicle processing;

(3) enhancements to range capacity and flexibility; and

(4) such other projects as the Administrator considers appropriate to meet the goals described in subsection (a).

(c) REQUIREMENTS.—In carrying out the program under subsection (a), the Administrator shall—

(1) prioritize investments in projects that can be used by multiple users and launch vehicles, including non-NASA users and launch vehicles; and

(2) limit investments to projects that would not otherwise be funded by a NASA program, such as an

institutional or programmatic infrastructure program.

(d) SAVINGS CLAUSE.—Nothing in this section shall preclude a NASA program, including the Space Launch System and Orion, from using the launch infrastructure modernized under this section.

SEC. 811. MISSIONS OF NATIONAL NEED.

(a) SENSE OF CONGRESS.—It is the Sense of Congress that—

(1) while certain space missions, such as asteroid detection or space debris mitigation or removal missions, may not provide the highest-value science, as determined by the National Academies of Science, Engineering, and Medicine decadal surveys, such missions provide tremendous value to the United States and the world; and

(2) the current organizational and funding structure of NASA has not prioritized the funding of missions of national need.

(b) STUDY.—

(1) IN GENERAL.—The Director of the Office of Science and Technology Policy shall conduct a study on the manner in which NASA funds missions of national need.

(2) MATTERS TO BE INCLUDED.—The study conducted under paragraph (1) shall include the following:

(A) An identification and assessment of the types of missions or technology development programs that constitute missions of national need.

(B) An assessment of the manner in which such missions are currently funded and managed by NASA.

(C) An analysis of the options for funding missions of national need, including—

(i) structural changes required to allow NASA to fund such missions; and

(ii) an assessment of the capacity of other Federal agencies to make funds available for such missions.

(c) REPORT TO CONGRESS.—Not later than 1 year after the date of the enactment of this Act, the Director of the Office of Science and Technology Policy shall submit to the appropriate committees of Congress a report on the results of the study conducted under subsection (b), including recommendations for funding missions of national need.

SEC. 812. EXEMPTION FROM THE IRAN, NORTH KOREA, AND SYRIA NONPROLIFERATION ACT.

Section 7(1) of the Iran, North Korea, and Syria Nonproliferation Act (Public Law 106–178; 50 U.S.C. 1701 note) is amended, in the undesignated matter following subparagraph (B), by striking "December 31, 2025" and inserting "December 31, 2030".

SEC. 813. DRINKING WATER WELL REPLACEMENT FOR CHINCOTEAGUE, VIRGINIA.

Notwithstanding any other provision of law, during the 5-year period beginning on the date of the enactment of this Act, the Administrator may enter into 1 or more agreements with the town of Chincoteague, Virginia, to reimburse the town for costs that are directly associated with—

(1) the removal of drinking water wells located on property administered by the Administration; and

(2) the relocation of such wells to property under the administrative control, through lease, ownership, or easement, of the town.

SEC. 814. PASSENGER CARRIER USE.

Section 1344(a)(2) of title 31, United States Code, is amended—

(1) in subparagraph (A), by striking "or" at the end;

(2) in subparagraph (B), by inserting "or" after the comma at the end; and

(3) by inserting after subparagraph (B) the following:

"(C) necessary for post-flight transportation of United States Government astronauts, and other astronauts subject to reimbursable arrangements, returning from space for the performance of medical research, monitoring, diagnosis, or treatment, or other official duties, prior to receiving post-flight medical clearance to operate a motor vehicle,".

SEC. 815. USE OF COMMERCIAL NEAR-SPACE BALLOONS.

(a) SENSE OF CONGRESS.—It is the sense of Congress that the use of an array of capabilities, including the use of commercially available near-space balloon assets, is in the best interest of the United States.

(b) USE OF COMMERCIAL NEAR-SPACE BALLOONS.—The Administrator shall use commercially available balloon assets operating at near-space altitudes, to the maximum extent practicable, as part of a diverse set of capabilities to effectively and efficiently meet the goals of the Administration.

SEC. 816. PRESIDENT'S SPACE ADVISORY BOARD.

Section 121 of the National Aeronautics and Space Administration Authorization Act, Fiscal Year 1991 (Public Law 101–611; 51 U.S.C. 20111 note) is amended—

*(1) in the section heading, by striking "**USERS' ADVISORY GROUP**" and inserting "**PRESIDENT'S SPACE ADVISORY BOARD**"; and*

(2) by striking "Users' Advisory Group" each place it appears and inserting "President's Space Advisory Board."

SEC. 817. INITIATIVE ON TECHNOLOGIES FOR NOISE AND EMISSIONS REDUCTIONS.

(a) INITIATIVE REQUIRED.—Section 40112 of title 51, United States Code, is amended—

(1) by redesignating subsections (b) through (f) as subsections (c) through (g), respectively; and

(2) by inserting after subsection (a) the following new subsection (b):

"(b) TECHNOLOGIES FOR NOISE AND EMISSIONS REDUCTION.—

"(1) INITIATIVE REQUIRED.—The Administrator shall establish an initiative to build upon and accelerate previous or ongoing work to develop and demonstrate new technologies, including systems architecture, components, or integration of systems and airframe structures, in electric aircraft propulsion con-

cepts that are capable of substantially reducing both emissions and noise from aircraft.

"(2) APPROACH.—In carrying out the initiative, the Administrator shall do the following:

"(A) Continue and expand work of the Administration on research, development, and demonstration of electric aircraft concepts, and the integration of such concepts.

"(B) To the extent practicable, work with multiple partners, including small businesses and new entrants, on research and development activities related to transport category aircraft.

"(C) Provide guidance to the Federal Aviation Administration on technologies developed and tested pursuant to the initiative.".

(b) REPORTS.—Not later than 180 days after the date of the enactment of this Act, and annually thereafter as a part of the Administration's budget submission, the Administrator shall submit a report to the appropriate committee of Congress on the progress of the work under the initiative required by subsection (b) of section 40112 of title 51, United States Code (as amended by subsection (a) of this section), including an updated, anticipated timeframe for aircraft entering into service that produce 50 percent less

noise and emissions than the highest performing aircraft in service as of December 31, 2019.

SEC. 818. REMEDIATION OF SITES CONTAMINATED WITH TRICHLOROETHYLENE.

(a) IDENTIFICATION OF SITES.—Not later than 180 days after the date of the enactment of this Act, the Administrator shall identify sites of the Administration contaminated with trichloroethylene.

(b) REPORT REQUIRED.—Not later than 1 year after the date of the enactment of this Act, the Administrator shall submit to the appropriate committees of Congress a report that includes—

(1) the recommendations of the Administrator for remediating the sites identified under subsection (a) during the 5-year period beginning on the date of the report; and

(2) an estimate of the financial resources necessary to implement those recommendations.

SEC. 819. REPORT ON MERITS AND OPTIONS FOR ESTABLISHING AN INSTITUTE RELATING TO SPACE RESOURCES.

(a) REPORT.—

(1) IN GENERAL.—Not later than 180 days after the date of the enactment of this Act, the Administrator shall submit to the appropriate committees of

Congress a report on the merits of, and options for, establishing an institute relating to space resources to advance the objectives of NASA in maintaining United States preeminence in space described in paragraph (3).

(2) MATTERS TO BE INCLUDED.—The report required by paragraph (1) shall include an assessment by the Administrator as to whether—

(A) a virtual or physical institute relating to space resources is most cost effective and appropriate; and

(B) partnering with institutions of higher education and the aerospace industry, and the extractive industry as appropriate, would be effective in increasing information available to such an institute with respect to advancing the objectives described in paragraph (3).

(3) OBJECTIVES.—The objectives described in this paragraph are the following:

(A) Identifying, developing, and distributing space resources, including by encouraging the development of foundational science and technology.

(B) Reducing the technological risks associated with identifying, developing, and distributing space resources.

(C) Developing options for using space resources—

(i) to support current and future space architectures, programs, and missions; and

(ii) to enable architectures, programs, and missions that would not otherwise be possible.

(4) DEFINITIONS.—In this section:

(A) EXTRACTIVE INDUSTRY.—The term "extractive industry" means a company or individual involved in the process of extracting (including mining, quarrying, drilling, and dredging) space resources.

(B) INSTITUTION OF HIGHER EDUCATION.—The term "institution of higher education" has the meaning given the term in section 101(a) of the Higher Education Act of 1965 (20 U.S.C. 1001(a)).

(C) SPACE RESOURCE.—

(i) IN GENERAL.—The term "space resource" means an abiotic resource in situ in outer space.

(ii) INCLUSIONS.—The term "space resource" includes a raw material, a natural material, and an energy source.

SEC. 820. REPORT ON ESTABLISHING CENTER OF EXCELLENCE FOR SPACE WEATHER TECHNOLOGY.

(a) IN GENERAL.—Not later than 180 days after the date of the enactment of this Act, the Administrator shall submit to the appropriate committees of Congress a report assessing the potential benefits of establishing a NASA center of excellence for space weather technology.

(b) GEOGRAPHIC CONSIDERATIONS.—In the report required by subsection (a), the Administrator shall consider the benefits of establishing the center of excellence described in that subsection in a geographic area—

(1) in close proximity to—

(A) significant government-funded space weather research activities; and

(B) institutions of higher education; and

(2) where NASA may have been previously underrepresented.

SEC. 821. REVIEW ON PREFERENCE FOR DOMESTIC SUPPLIERS.

(a) SENSE OF CONGRESS.—It is the Sense of Congress that the Administration should, to the maximum extent

practicable and with due consideration of foreign policy goals and obligations under Federal law—

(1) use domestic suppliers of goods and services; and

(2) ensure compliance with the Federal acquisition regulations, including subcontract flow-down provisions.

(b) REVIEW.—

(1) IN GENERAL.—Not later than 180 days after the date of the enactment of this Act, the Administrator shall undertake a comprehensive review of the domestic supplier preferences of the Administration and the obligations of the Administration under the Federal acquisition regulations to ensure compliance, particularly with respect to Federal acquisition regulations provisions that apply to foreign-based subcontractors.

(2) ELEMENTS.—The review under paragraph (1) shall include—

(A) an assessment as to whether the Administration has provided funding for infrastructure of a foreign-owned company or State-sponsored entity in recent years; and

(B) an analysis of the effects such funding has had on domestic service providers.

(c) REPORT.—The Administrator shall submit to the appropriate committees of Congress a report on the results of the review.

SEC. 822. REPORT ON UTILIZATION OF COMMERCIAL SPACE PORTS LICENSED BY FEDERAL AVIATION ADMINISTRATION.

(a) IN GENERAL.—Not later than 1 year after the date of the enactment of this Act, the Administrator shall submit to the appropriate committees of Congress a report on the benefits of increased utilization of commercial space ports licensed by the Federal Aviation Administration for NASA civil space missions and operations.

(b) ELEMENTS.—The report required by subsection (a) shall include the following:

(1) A description and assessment of current utilization of commercial space ports licensed by the Federal Aviation Administration for NASA civil space missions and operations.

(2) A description and assessment of the benefits of increased utilization of such space ports for such missions and operations.

(3) A description and assessment of the steps necessary to achieve increased utilization of such space ports for such missions and operations.

SEC. 823. ACTIVE ORBITAL DEBRIS MITIGATION.

(a) SENSE OF CONGRESS.—It is the sense of Congress that—

(1) orbital debris, particularly in low-Earth orbit, poses a hazard to NASA missions, particularly human spaceflight; and

(2) progress has been made on the development of guidelines for long-term space sustainability through the United Nations Committee on the Peaceful Uses of Outer Space.

(b) REQUIREMENTS.—The Administrator should—

(1) ensure the policies and standard practices of NASA meet or exceed international guidelines for spaceflight safety; and

(2) support the development of orbital debris mitigation technologies through continued research and development of concepts.

(c) REPORT TO CONGRESS.—Not later than 90 days after the date of the enactment of this Act, the Administrator shall submit to the appropriate committees of Congress a report on the status of implementing subsection (b).

SEC. 824. STUDY ON COMMERCIAL COMMUNICATIONS SERVICES.

(a) SENSE OF CONGRESS.—It is the sense of Congress that—

(1) enhancing the ability of researchers to conduct and interact with experiments while in flight would make huge advancements in the overall profitability of conducting research on suborbit and low-Earth orbit payloads; and

(2) current NASA communications do not allow for real-time data collection, observation, or transmission of information.

(b) STUDY.—The Administrator shall conduct a study on the feasibility, impact, and cost of using commercial communications programs services for suborbital flight programs and low-Earth orbit research.

(c) REPORT.—Not later than 18 months after the date of the enactment of this Act, the Administrator shall submit to Congress and make publicly available a report that describes the results of the study conducted under subsection (b).

Calendar No. 525

116TH CONGRESS
2D SESSION

S. 2800

[Report No. 116–262]

A BILL

To authorize programs of the National Aeronautics and Space Administration, and for other purposes.

SEPTEMBER 8, 2020

Reported with an amendment